PHOTOFACT® Folder

INDEX

A cumulative index is included as a part of this Folder. Upon finding that a new tube is not listed on the roll chart of a tester covered in this service, refer to the latest Tube Tester Data Index to determine in which PHOTOFACT Set the data was published. If listed, reference to that Folder will provide the necessary data.

TUBE TYPES	JACKSON 598, 648, and 658 See PHOTOFACT Set No.	TUBE TYPES	JACKSON 598, 648, and 658 See PHOTOFACT Set No.	TUBE TYPES	JACKSON 598, 648, and 658 See PHOTOFACT Set No.
2CW4♦	544	6DA4	552†	10BQ5	552
2EV5	512	6DX8	552	10EM7	532
2FQ5	524	6EQ7	516	10HF8	536
2FS5	552	6ES8	524†	11JE8	556
2FY5	512	6ET7	544	12BZ6	524†
2GK5	548	6FA7	524	12DY8	516
3AW3	548	6FD7	556	12EQ7	552
3ES5	524	6FG7	552	12GW6	528
3EV5	512	6FJ7♦	548	13EM7	512
3GK5	556	6FQ5	524	14JG8	552
4AV6	532	6FQ7	532	15EA7	528
4ES8	524	6FS5	520	17DM4	532
4GS8	516	6FW5	520	17GW6	528
5DJ4	528	6FY5	552†	19EZ8	524
5EW6	536	6GK5	544	19HV8	536
5FG7	544	6GW6	528	20EZ7	548
6AJ8	524†	6GW8	528	25DK4	540
6AL3	524	6GX6	532	34GD5	508
6AX3♦	548	6GY6	536	35HB8	548
6B10♦	552	6HF8	532	50FK5	536
6C10♦	548	6HG8	528	VR75	524†
6CB5	524†	6HJ8	516	7233	540
6CB6	524†	6HS8	524	7586♦	548
6CD6	524†	6JC8	544	7587♦	548
6CD7	512	6JH8	556	7695	512
6CQ4	528	6K11♦	544	7701	520
6CW4♦	544	8ET7	516	7716	520
6D10♦	544	8FQ7	536	7895♦	548
6D10♦	552†				

† See correction notice.

♦ These types can only be tested on 648S, 658A, 648 converted with 648 SM kit, and 658 converted with 658 SM kit.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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TUBE TESTER DATA • SET 556

JACKSON MODEL 598

SET 556

SUPPLEMENTS LATEST ROLL CHART 598-3

Tube Type	A.	B.	Fil. C.	Fil. Cont.	D.	E.	F.	G.
3GK5	3.0	3YZ	7	4	5	2		48
6FD7	6.3	4		5	6	7		59
	"	4	2		1	3		34
6JH8	6.3	4Z		5	9	2	3	95
	"	4Z			8	1	3	95
11JE8	10.5	4Y		5	9	7	8	29
	"	4Y			3	2		60

JACKSON MODEL 648

SET 556

SUPPLEMENTS LATEST ROLL CHART 648-25

Tube Type	Fil.	D.	E.	Plate Test
3GK5	3.0	A234	A57	22 YZ
6FD7	6.3	A127	A89	27 WX
	"	126	A45	31 VW
6JH8	6.3	1289	AB347	35 XZ
	"	"	AB356	35 XZ
11JE8	10.5	A129	678*	22 XZ
	"	A124	A35	28 XZ

CORRECTION NOTICE ON ROLL CHART 648-25 FOR MODEL 648

Tube Type	Fil.	D.	E.	Plate Test
6DA4	6.3	234	6	15 W
6D10♦	6.3	AC3	AC67	32 YZ
	"	AC4	AC59	32 YZ
	"	AC2	A18	32 YZ
6FY5	6.3	A234	A57	17 XZ

JACKSON MODEL 658

SET 556

SUPPLEMENTS LATEST ROLL CHART 658-5

Tube Type	Sec.	Heater	Circuit H-K	Circuit P-G	Plate	Grid Test	Heater Current
3GK5	T	3.0J	123	a57	21R	5WY•	A8.5F Z450
6FD7	T	6.4L	127	a89	83Q	10WY•	
	T	"	126	a45	18R	60VY•	
6JH8	B	6.4J	12459	c368	16Q	25WY•	
	B	"	"	c378	"	25WY•	
11JE8	T	10.6L	128	679	23R	15WY•	
	T	"	124	a35	68R	10WY•	A18.6G Z450

The PHOTOFACT® Servicer

SET 556 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ NOV. 1961

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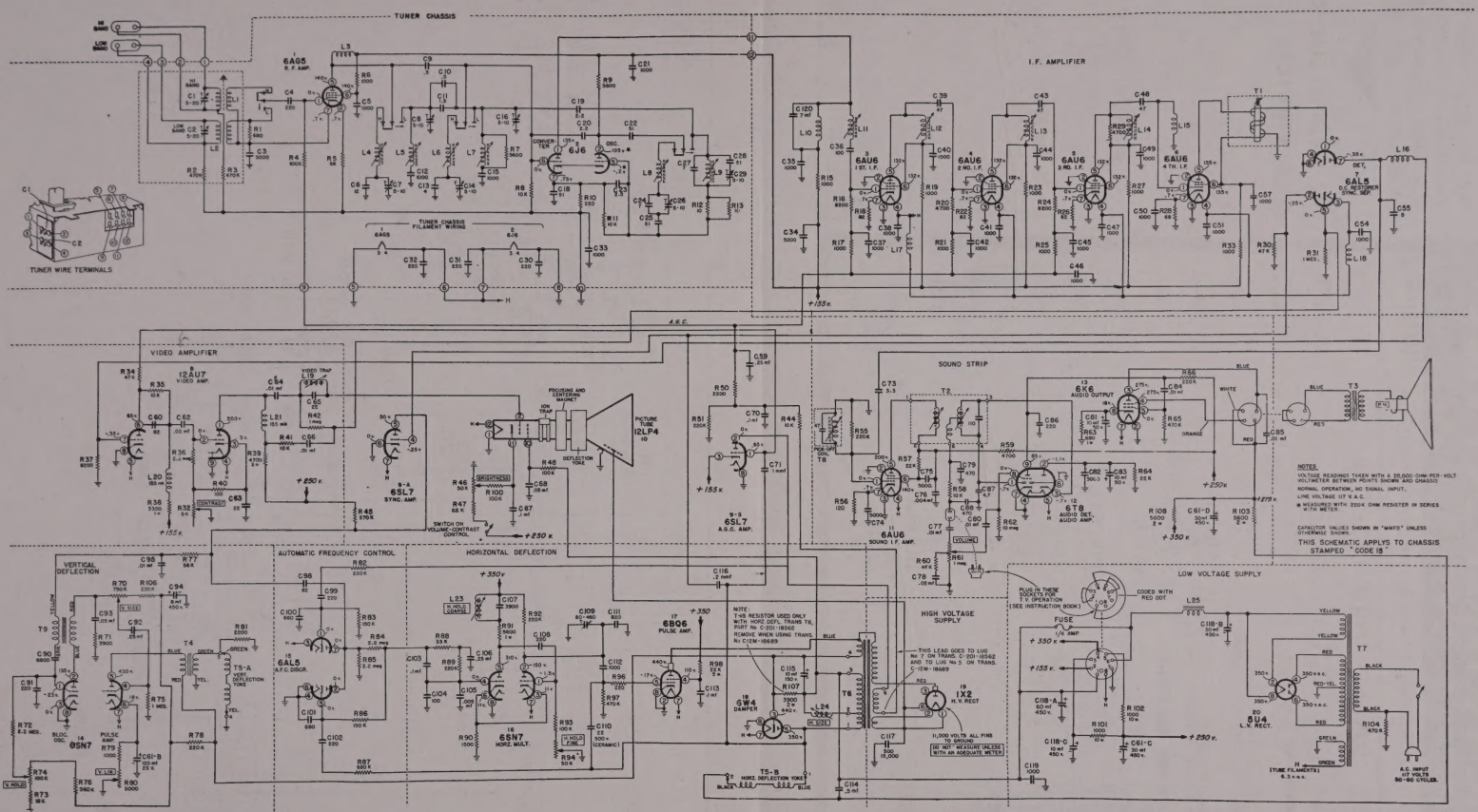
This Servicer provides you with essential data on other models or special equipment not covered in standard PHOTOFACT folders. The schematics and supplementary data included here will be of valuable help to you in servicing this equipment.

IN THIS ISSUE OF THE SERVICER:

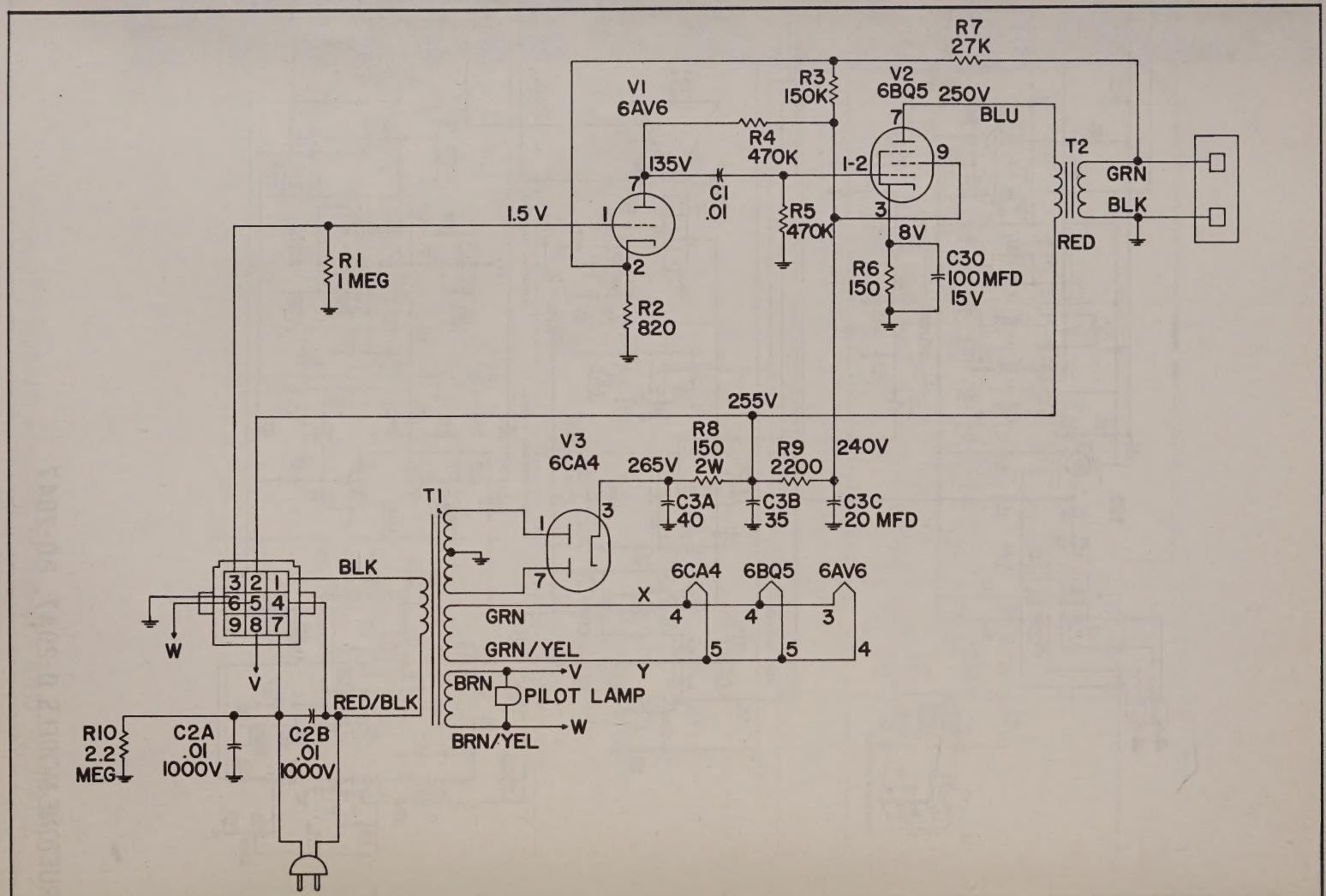
Magnavox Chassis
AMP-91

Truetone Models
D-2047, 2D-2047



TRUETONE MODELS D-2047, 2D-2047

Schematic Diagram Courtesy of Western Auto Supply Co.



MAGNAVOX CHASSIS AMP-91

Schematic Diagram Courtesy of The Magnavox Co.

PHOTOFACT® Folder with CIRCUITRACE®

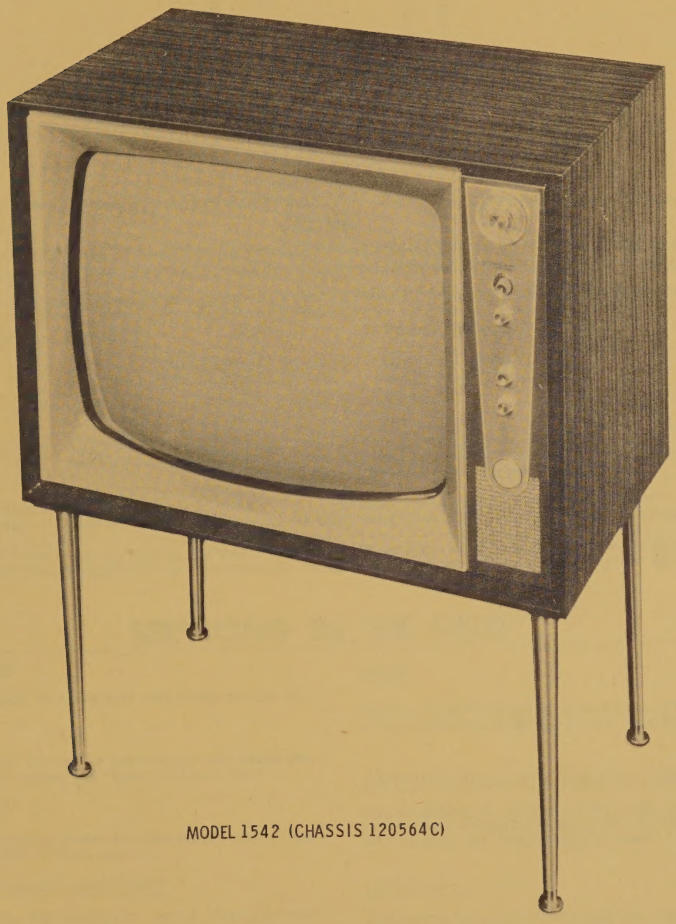
EMERSON
CHASSIS 120564C, 120565D

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

EMERSON
CHASSIS 120564C, 120565D



MODEL 1542 (CHASSIS 120564C)

EMERSON
CHASSIS 120564C, 120565D

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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MODEL 1542

CAUTION

Care should be exercised when connecting test equipment or physically contacting chassis. Isolation devices employed by manufacturer should be checked and properly connected before returning receiver to owner.

TRADE NAME	EMERSON	Models	TV Chassis	VHF Tuner UHF Tuner
		1542, 1548, 1534A/B, 1550 ...	120564C ...	471230
		1543, 1549, 1535A/B, 1551 ...	120565D ...	471231 ... 471220
		CHASSIS WITH MODIFICATIONS MARKED △A and △B		
MANUFACTURER	Emerson Radio and Phonograph Corp., 524 W. 23rd St., New York 11, N. Y.			
TYPE SET	Television Receiver (Models 1534A/B, 1535A/B, 1550, 1551 with *FM-AM Tuner, *Stereo Amp., and *4 Speed Automatic Record Changer)			
TUBES	VHF - Sixteen, UHF - Seventeen			
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING	160 Watts, 1.5 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)			

* FOR SERVICE INFORMATION ON FM-AM TUNER 120533B, AMP 120536B - SEE PHOTOFACT SET 521 FOLDER 1
FOR SERVICE INFORMATION ON RECORD CHANGER #819159 - SEE SIMILAR UNIT - PHOTOFACT SET 408 FOLDER 6

SERVICING IN THE FIELD

SAFETY GLASS

The safety glass is an integral part of the picture tube.

FUSE

A 1.6 Amp. fuse is used for low voltage power supply protection. (For location, see "Tube Placement Chart".)

FUSE DEVICE

A 1Ω fusible resistor is used for filament protection. (For location, See R81 in Photo, page 3.)

TUNER OSCILLATOR ADJUSTMENT

To touch up the VHF Oscillator, remove Channel Selector and Fine Tuning knobs.

AGC

No provision is made to vary the AGC on this receiver.

FOCUS

The focus may be varied by connecting the lead from pin 6 of the picture tube to 250V or ground. (See TV Schematic).

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Coarse adjustment of the Horizontal Hold is accomplished by the proper setting of the Horizontal Frequency Slug (B1). (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

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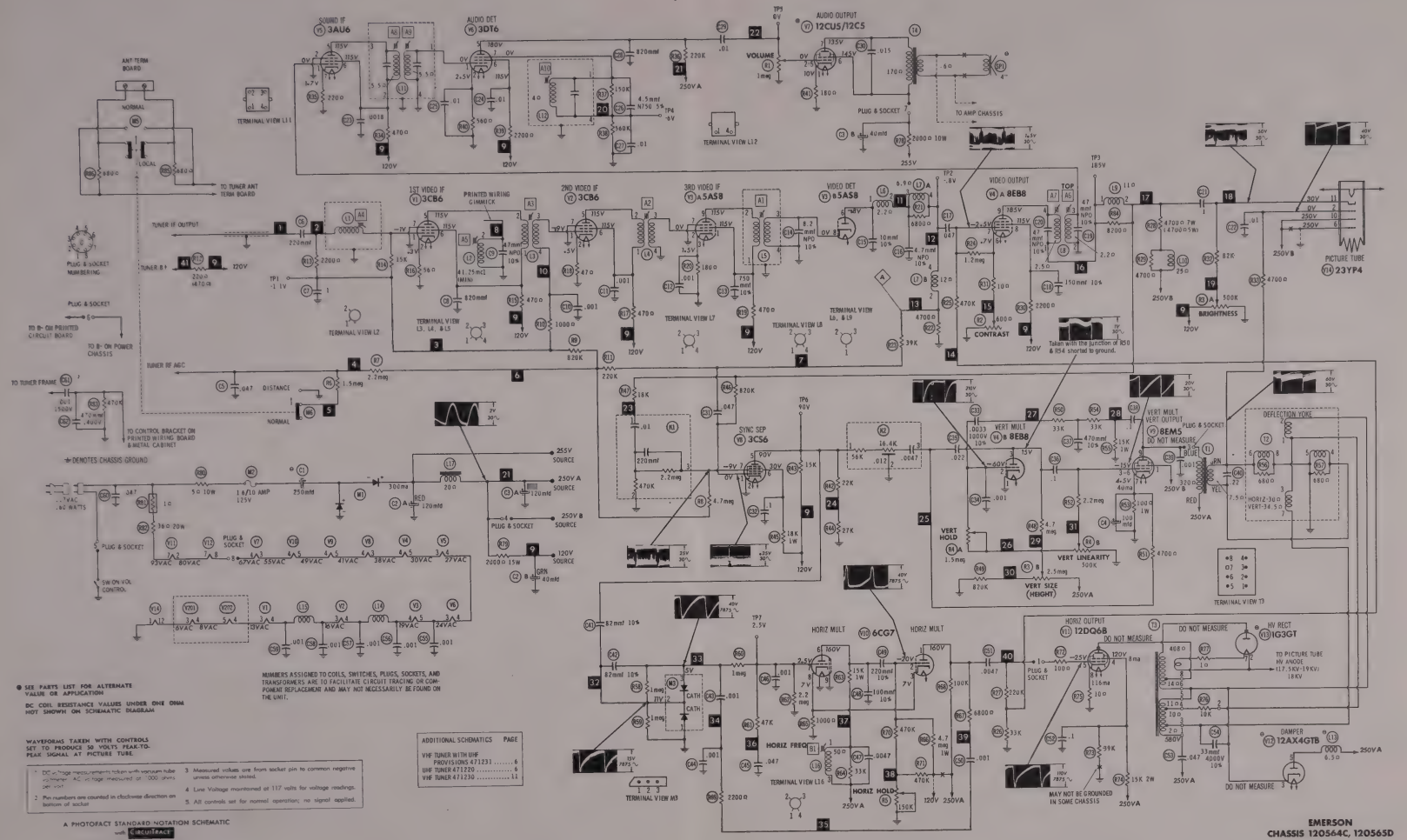
SET 556 FOLDER 1
EMERSON
CHASSIS 120564C, 120565D
EMERSON
CHASSIS 120564C, 120565D



● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.

1. DC voltage measurements taken with vacuum tube voltmeter. AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.

ADDITIONAL SCHEMATICS PAGE

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UHF TUNER 471220 6
VHF TUNER 471230 11

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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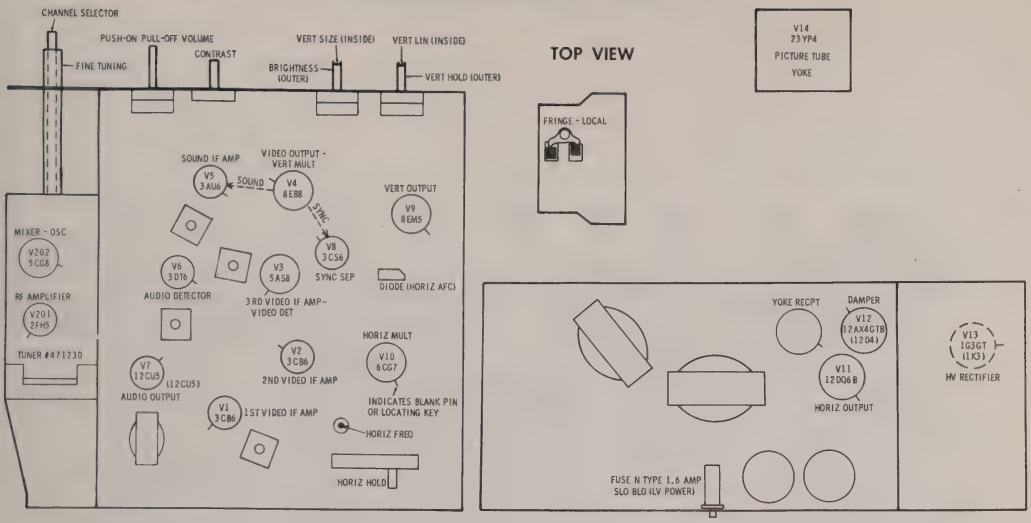
TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

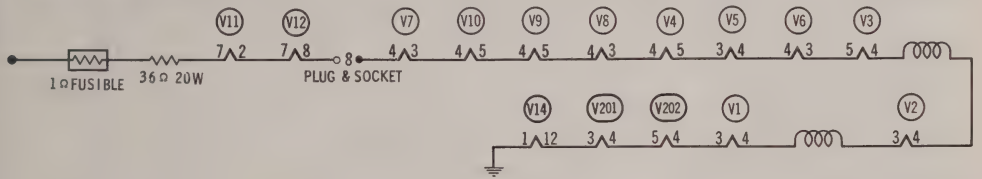
POWER SUPPLY FAILURE
No raster, no sound Fuse (Line), Rectifiers M1, M2, Resistor (Fusible)

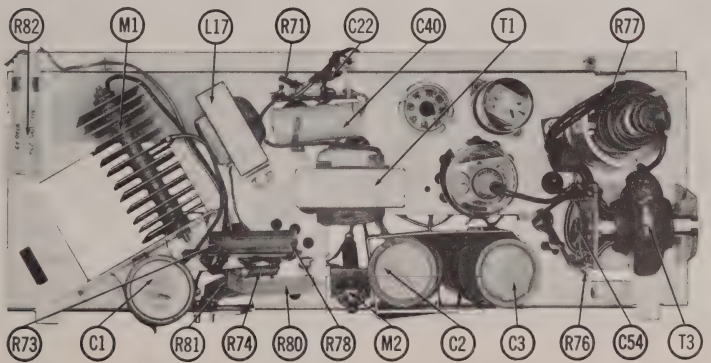
SWEEP FAILURE
No raster, has sound V10, V11, V12, V13, V14
No vertical deflection V4, V9
Poor vert. linearity or foldover V4, V9
Poor horiz. linearity or foldover V10, V11, V12
Narrow picture V10, V11, V12, M1, M2
Vert. off freq. V4, V9
Horiz. off freq. Diode (Horiz. AFC), V10

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V14
Has pic, no sound V5, V6, V7

SYNC FAILURE
No vert. sync V8
No horiz. sync V8
No vert. or horiz. sync V8

This receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative. (See circuit below.)





POWER CHASSIS—TOP VIEW

SET 556 FOLDER 1

EMERSON
CHASSIS 120564C, 120565D

FOLDER 1

A Howard W. Sams CIRCUITRACE® Photo

PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

TV ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545

VIDEO IF ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough generator output to provide a usable indication.
Connect the negative lead of a 3 volt bias supply to point TP-1. Positive to chassis.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Place a thin insulated metal strip between the Mixer-Osc. tube and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	Not used	44.25MC (Unmod.)	Any non-interfering channel	Use VTVM DC probe thru 10K to point (A). Common to chassis.	A1	Adjust for maximum deflection.
2.	"	"	45.1MC	"	"	A2	"
3.	"	"	42.6MC	"	"	A3	"
4.	"	"	43.1MC	"	"	A4	"
5.	"	"	41.25MC	"	"	A5	Adjust for MINIMUM deflection.
6.	"	44.0MC (10MC Swp.)	45.75MC	"	Vert. Amp. thru 20K to point (A). Low side to chassis.	Mixer Plate Coil	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown.

4.5MC TRAP ALIGNMENT

Tune in a strong TV signal and set Contrast at maximum. Adjust the Fine Tuning until a beat pattern is visible. Adjust A6 for MINIMUM beat interference.

SOUND IF ALIGNMENT

Tune in a strong TV signal and adjust A7, A8 and A9 for loudest sound. Adjust A10 for clearest and loudest sound. If two peaks occur, peak with slug nearest chassis.
Disconnect antenna lead and loosely couple to obtain a weak signal and repeat adjustment of A7, A8 and A9 tuning for maximum sound and MINIMUM distortion.
Check the voltage at TP-6 using a VTVM. It should measure between -4 and -9 volts and should not vary more than two volts between a strong signal and a weak one.
Check sound on all available channels and repeat entire procedure, if necessary.

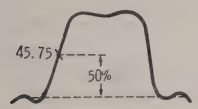
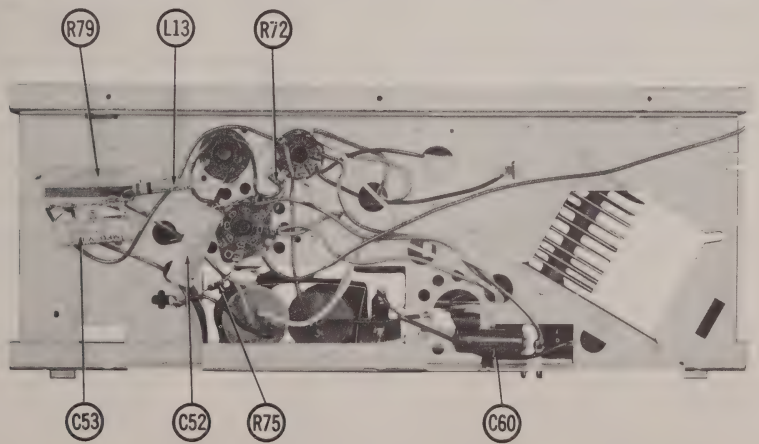


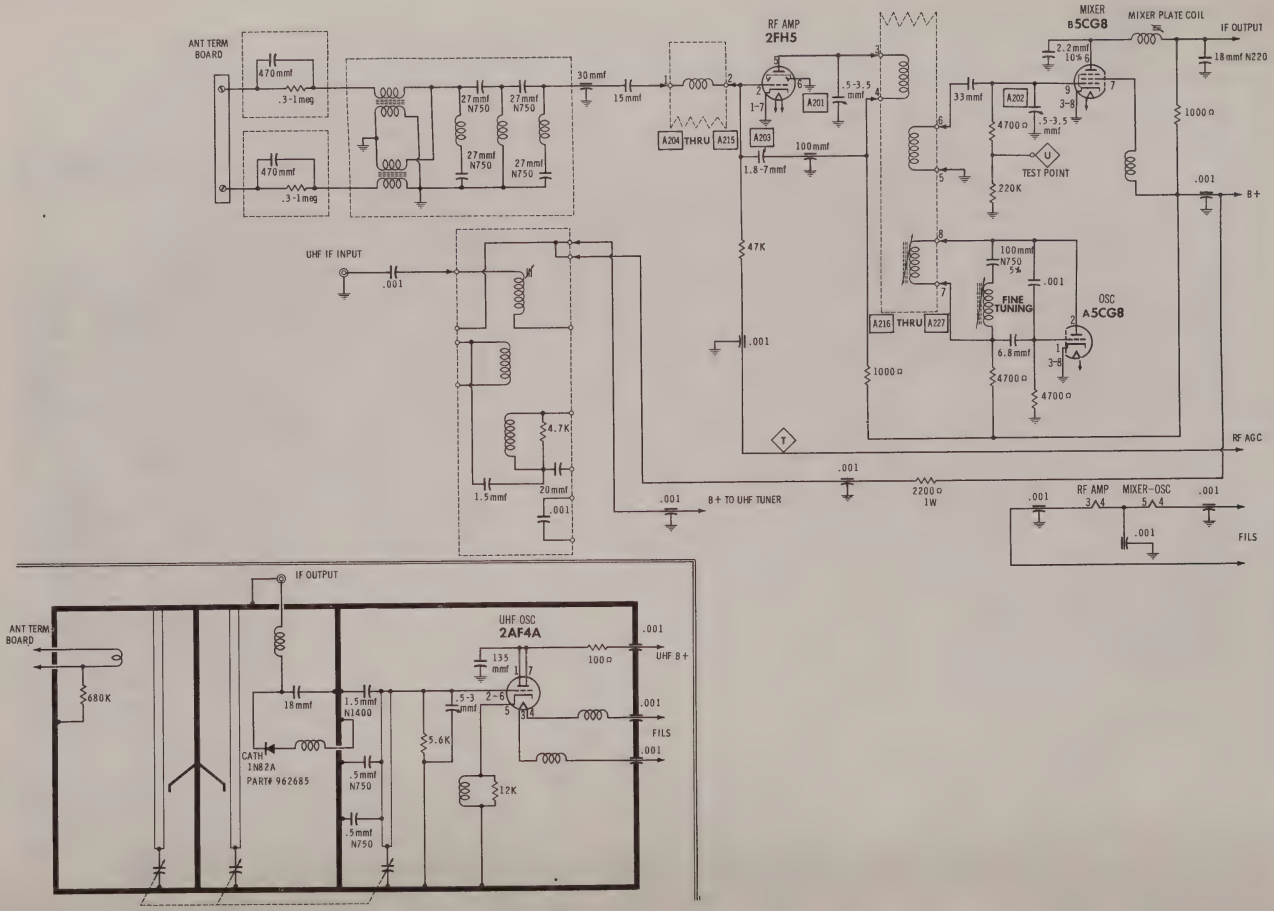
FIG.1

ALIGNMENT IDENT. PHOTO PAGE 14



POWER CHASSIS - BOTTOM VIEW

SET 556 FOLDER 1



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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UHF TUNER 471220
VHF TUNER WITH UHF PROVISIONS 471231

VHF TUNER ALIGNMENT INSTRUCTIONS
(ALIGNMENT IDENT. PHOTO PAGE 12)

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

VHF RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Connect the negative lead of a 2.5 volt bias supply to point (T). Positive to chassis.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point (U). Low side to chassis.	A201 A202 A203	Adjust A201 and A202 for maximum amplitude and symmetry with markers as shown in Fig. 201. Increase bias for MINIMUM amplitude of response curve. Without changing the bias adjust A203 to obtain MINIMUM response on the scope.
2.	"	"	213MC	211.25MC 215.75MC	13	"	A204	Adjust for maximum amplitude of response similar to Fig. 201. Adjust by expanding or compressing coil turns.
			207MC	205.25MC 209.75MC	12		A205	
			201MC	199.25MC 203.75MC	11		A206	
			195MC	193.25MC 197.75MC	10		A207	
			189MC	187.25MC 191.75MC	9		A208	
			183MC	181.25MC 185.75MC	8		A209	
			177MC	175.25MC 179.75MC	7		A210	
			85MC	83.25MC 87.75MC	6		A211	
			79MC	77.25MC 81.75MC	5		A212	
			69MC	67.25MC 71.75MC	4		A213	
			63MC	61.25MC 65.75MC	3		A214	
			57MC	55.25MC 59.75MC	2		A215	

VHF OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47KΩ across Video Det. load.	A216	Adjust to place sound marker in trap notch as in Fig. 202. Video marker should fall at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A217	
			201MC	199.25MC 203.75MC	11		A218	
			195MC	193.25MC 197.75MC	10		A219	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A220	
			183MC	181.25MC 185.75MC	8		A221	
			177MC	175.25MC 179.75MC	7		A222	
			85MC	83.25MC 87.75MC	6		A223	
			79MC	77.25MC 81.75MC	5		A224	
			69MC	67.25MC 71.75MC	4		A225	
			63MC	61.25MC 65.75MC	3		A226	
			57MC	55.25MC 59.75MC	2		A227	

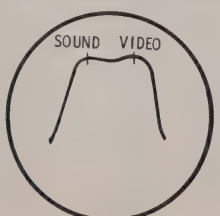


FIG. 201

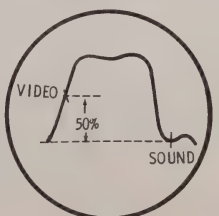


FIG. 202

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	GENERAL ELECTRIC • USE	GENERAL ELECTRIC • TYPE	RAYTHEON • USE	RAYTHEON • TYPE	SYLVANIA • USE	SYLVANIA • TYPE
V1	1st Video IF Amp.	3CB6	V7	Audio Output	V8 Sync Separator	3CB6
V2	2nd Video IF Amp.	3CB6			V9 Vert. Output	8EM5
V3	3rd Video IF Amp. - Video Detector	5AS8			V10 Horiz. Mult.	6CG7
V4	Video Output - Vert. Mult.	8EB8			V11 Horiz. Output	[illegible]
V5	Sound IF Amp.	3AU8			V12 Damper	12AX4GTB (12D4) *
V6	Audio Detector	3DT6			V13 HV Rectifier	1G3GT (1K3) *

* Alternate

PICTURE TUBE

ITEM No.	REPLACEMENT DATA: EMERSON PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
V14	23YP4	23YP4/XP4 ①	23YP4 ①		23YP4 ②	① Aluminized ② Silver Screen "85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: EMERSON PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1	250 ①	150	925542	PRI-075	BR20015	QT1-29	TC499	TD-250-150	TVA8-1434 *
C2A	120	300	925544	PRI-046-50	BBRT0196		WT434		TVA8-2586 *
B	40	300							
C3A	120	300	925543	PR3-046-50	BBRT0196		WT434		TVA8-2586 *
B	40	300							
C4	100	50	925442	PRS360	BR1005	QT1-23	TC3501	TD-100-50	TVA-1310

① Some versions may use 130mfd @ 150V in this application.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	.047 200V		P288N-047	DD-503	CUBD347	4DP-3-473	GEM-4147	2TM-S47
C6	220		DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22
C7	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C8	820		DD-821	DD-821	BYA10T82	CCD-821	B-382	10TS-T82
C9	47 NPO 10%		NPO-DI 47	DTN-47	C10Q47C	CCTO-470	CNO-447	10TCC-Q47
C10	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C11	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C12	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C13	750 10%		DI-750	DR5T75	C10Q5JC	CCD-751	GP375	10TS-T75
C14	6.2 NPO 10%		NPO-DI 6.2	DTN-6R2				10TCC-V62
C15	10 10%		DI-10	DD-100	L10Q1	CCD-100	GP410	10TS-Q10
C16	4.7 NPO 10%		NPO-DI 4.7	DTZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C17	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C18	150 10%		DI-150	DD-151	L10T15	CCD-151	GP315	10TS-T15
C19	47 NPO 10%		NPO-DI 47	DTZ-47	C10Q47C	CCTO-470	CNO-447	10TCC-Q47
C20	47 NPO 10%		NPO-DI 47	DTZ-47	C10Q47C	CCTO-470	CNO-447	10TCC-Q47
C21	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C22	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C23	.0018		DI-1800	DD-182	L10D18	CCS-182	B-218	10TS-DX8
C24	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C25	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C26	4.5 N750 5%			DTN-5	C10V5U	CCTO-050	CN7-547	10TCU-V50
C27	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C28	820		DI-820	DD-821	BYA10T82	CCD-821	B-382	10TS-T82
C29	.01 400V		P488N-01	DS-104	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C30	.015		BPD-015	DD-153	BYA10S15	CCD-153	B-115	5HK-S15
C31	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C32	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C33	.0033 1000V	10%			DPMG8D333	16DP-3-332	GEM-16333	10TM-D33
C34	.001		BPD-001	DD-102	BYA10D1	CCD-103	B-210	5HK-D10
C35	.022 400V		P488N-022	DD-203	CUB4S22	4DP-2-233	GEM-4122	4TM-S22
C36	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C37	470	DI-470	DD-471	SR5T47	CCD-471	GP347	10TS-T47	
C38	.1 600V		P688N-1	DF-104	CUB6P1	6DP-6-104	GEM-601	6TM-P10
C39	.001		BPD-001	DD-102	BYA10D1	CCD-103	B-210	5HK-D10
C40	.22 400V		P488N-022		CUB4P22	4DP-5-224	GEM-4022	4TM-P22
C41	82	10%	DI-82	DD-820	L10Q82	CCD-820	GP482	10TS-Q82
C42	82	10%	DI-82	DD-820	L10Q82	CCD-821	GP482	10TS-Q82
C43	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C44	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C45	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C46	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C47	.0047 600V		P688N-0047	DS-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C48	1000	10%	1469-0002	TCZ-100	22S1T1	CM-19S-101K	MCB325	MS-310
C49	220	10%	1459-00022	TCZ-220	22S1T22	CM-19S-221K	CNO-322	MS-322
C50	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C51	.0047 400V		P488N-0047	DS-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C52	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C53	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C54	33 4000V	10%	#929041				6DY-433	
C55	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C56	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C57	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C58	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C59	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C60	.047 600V		P688N-047	DD-102	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C61	.001 1500V		HVD-15-1000	DD30-102	HVB16D1	3CCD-102	2HV-210	3L-D10
C62	470 1500V		HVD-15-470	DD30-470	HVB16T47	3CCD-471	2HV-347	30GA-T47

Emerson Part Number

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: EMERSON PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS - IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	390634	BPL-70	C47S-1meg-Z	B13-137 *	PP16A	Volume
B	Shaft			Not Req.	F3-3	Not Req.	Not Req.	
C	Switch			Not Req.	Not Req.	SK7 *	Not Req.	Push-Push Off-On
R2A	500Ω	½	390618	F3-2		—	FA8J25	Contrast
B	Shaft			Not Req.		↑ (UE-1350	OS2J25	
R3A	500K	½	390619	F1-40		♦ (GJ-1277	■ UE4140	Brightness
B	2.5meg			R2-78				Vert. Size (Height)
R4A	1.5meg	½	390620	F1-84		♦♦ (GJ-1278	▲ UE4138	Vert. Hold
B	500K			R2-40				Vert. Linearity
R5	150K	½	390621					Horiz. Hold

* Factory Assembled Part #PPQ13-13T (SKT).
↑ "CONCENTRIKIT" Equivalent: K-6 Kit with Base Elements and Shafts: B17-105, P17-304 (Panel)
♦ "CONCENTRIKIT" Equivalent: K-6 Kit with Base Elements and Shafts: B11-133, P17-304 (Panel)
(Not available as a factory assembled unit). B11-129, R15-005 (Rear)
†† "CONCENTRIKIT" Equivalent: K-6 Kit with Base Elements and Shafts: B11-138, P17-304 (Panel)
(Not available as a factory assembled unit). B11-133, R15-005 (Rear)
■ "STA-LOC" Equivalent: FA351, RU351, OS2125, 1K325.
▲ "STA-LOC" Equivalent: FA351, RU351, OS2125, 1K325.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R6	1.5meg			
R7	2.2meg			
R8	4.7meg			
R9	820K			
R10	1000Ω			
R11	220K			
R12	220Ω			(470Ω) *
R13	2200Ω			
R14	15K			
R15	470Ω			
R16	56Ω			
R17	470Ω			
R18	47Ω			
R19	470Ω			
R20	180Ω			
R21	6800Ω			
R22	4700Ω			
R23	39K			
R24	1.2meg			
R25	470K			
R26	33K			
R27	220K			
R28	4700Ω TW	PWT-4700	TW-8Q-4700	Note 1
R29	4700Ω			
R30	2200Ω			
R31	10Ω			
R32	82K			
R33	4700Ω			
R34	470Ω			
R35	220Ω			
R36	220K			
R37	150K			
R38	560K			
R39	2200Ω			
R40	560Ω			
R41	180Ω			
R42	22K			
R43	15K			
R44	27K			
R45	18K 1W			
R46	820K			

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R47	18K			
R48	4.7meg			
R49	820K			
R50	33K			
R51	4700Ω			
R52	2.2meg			
R53	100Ω 1W			
R54	33K			
R55	15K 1W			
R56	680Ω			
R57	680Ω			
R58	1meg			
R59	1meg			
R60	1meg			
R61	47K			
R62	2.2meg			
R63	15K 1W			
R64	33K			
R65	100Ω			
R66	4.7meg 1W			
R67	6800Ω			
R68	100K			
R69	2200Ω			
R70	470K			
R71	470K			
R72	100Ω			
R73	39K			
R74	15K 2W			
R75	10Ω			
R76	10K			
R77	1Ω			
R78	2000Ω 10W	PW10-2000	10W-8Q-2000	
R79	2000Ω 15W	PW15-2000	15W-8Q-2000	
R80	5Ω 10W	PW10-5	10W-8Q-5	
R81	1Ω (Fusible)			#397103
R82	36Ω 20W			#397157
R83	470K			
R84	3300Ω			
R85	680Ω			
R86	680Ω			

* Value used in Chassis stamped△A.
Note 1. Some versions may use 4700Ω 5W.

Emerson Part Number.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	EMERSON PART No.	REPLACEMENT DATA
K1	Sync Sep. Grid	220mmf, .01mfd, 470K, 2.2meg	929068	
K2	Vert. Integrator	.0047mfd, .01mfd, 16.4K, 56K	923156	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: EMERSON PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	NOTES
L1	1st Video IF	720316				T274	①IRC Part #CL-1. Emerson Pt. #705021A may be used in some versions.
L2	2nd Video IF	720318				T272	
L3	4.25MC Trap	720317				T273	
L4	3rd Video IF	720318				T272	
L5	4th Video IF	720318				T272	
L6	RF Choke (4.5uh)	708271A	BC-564	4608	RTC-8518	T819	
L7A	Peaking (100uh)	708346A	TV-194	6112	RTC-8574	T305	
B	Peaking (220uh)		TV-185	6181	RTC-8598	T315	
L8A	4.5MC Trap	720297A	TV-236 †	1471-A †		T271	† Remove Caps.
B	1st Sound IF						
L9	Peaking (330uh)	708272A	TV-200	6132	RTC-8577	T349	
L10	Peaking (750uh)	708357	TV-206	6148	RTC-8588	T338	
L11	2nd Sound IF	720337				T270	
L12	Quadrature	720336	TV-234			T269	
L13	RF Choke (10uh)	705021 ①	BC-566	4612	RTC-8522	T980	
L14	Fil.Choke (1uh)	705031	BC-561	4602	RTC-8515	T955	
L15	Fil.Choke (1uh)	705031	BC-561	4602	RTC-8515	T955	

COILS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: EMERSON PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	Workman TV PART No.	NOTES
L16	Horiz. Stabilizer	716121A				HS-11		T128	

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	RATINGS: DC. RES.	RATINGS: INDUCTANCE (0 CURRENT 1000 ~\)	REPLACEMENT DATA: EMERSON PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
L17	.345A	20Ω	5 Hy.	737043		C-2343		C-27X	

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: EMERSON PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	Vert. Output	732180	A-2825 ①	VO-109 ①	26S76 ①	A-32X	
T2	Yoke (Horiz. 19MH)	708373	MDF-92 ②	DY-16A ②	Y-16 ②	Y-43-1 ③	
	(92°) (Vert. 39MH)						
	Rear Cover and Centering Device	708354					
	Yoke Clamp	414117					
T3	Horiz. Output	738179					

① Use 8 to 1 Turns Ratio.
② Requires new rear cover and centering device. Connect Yoke Terminal #3 to Horiz. Output Transformer Terminal #6; Yoke #2 and #7 to Horiz. Output Transformer Terminal #2; Yoke #1 to Horiz. Output Transformer Terminal #3, Yoke Terminals #5 and #8 to ground.
③ Remove network across Yoke Terminals #2 and #1.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: EMERSON PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T4	2400Ω	3-4Ω	734188	A-3025 ①	A-3333 ①	26S53 ①	S-12X ①	① Use original frame.

SPEAKER

ITEM No.	TYPE: SIZE	TYPE: FIELD	TYPE: V. C. IMP.	REPLACEMENT DATA: EMERSON PART No.	QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	180154B ①	4A07	① Used in Models 1542, 1543
	6"	PM		180175B ②		② Used in Models 1545, 1549
	3½"	PM	6-8Ω	180194 ③	3A15T25.4	③ Used in Models 1534A/B, 1535A/B, 1550, 1551.
	8"	PM	6-8Ω	180165A ③	LA8T2E	

POWER RECTIFIERS

ITEM No.	RATING: CURRENT (Measured)	REPLACEMENT DATA: EMERSON PART No.	RCA PART No.	SARKES TARZIAN PART No.	NOTES
M1	.300A	817105 ①	1N1763 ②	300 ①	① Selenium ② Silicon

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: EMERSON PART No. FUSE	EMERSON PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M2	N	1 6/10A 125V	808234		3330L 6	340010	N 1 6/10A	EN 1 1/2 to 1 3/4

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: EMERSON PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	NOTES
M3		817074	6GC1		Horiz. AFC Diode, Dual Selenium, Common Cathode Type

MISCELLANEOUS

ITEM No.	PART NAME	EMERSON PART No.	NOTES
M4	Tuner	471230	VHF, STANDARD COIL REPLACEMENT Type #GGS-4122A
	Tuner	471231	VHF with UHF Provisions
	Tuner	471220	UHF
M5	Switch	510174	Normal-Local (DPDT Type)
M6	Switch	510175	Normal-Distance (SPDT Type)

WIRING DATA

High Voltage Lead	Use BELDEN No. 8888
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

EMERSON CHASSIS 120564C, 120565D FOLDER 1

TUNER PARTS LIST AND DESCRIPTIONS

471230

TUBES

• GENERAL ELECTRIC •			RAYTHEON • SYLVANIA •		
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V201	RF Amp.	2FH5	V202	Mixer - Osc.	5CG8

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	120 N750 10%			TCN-120	C10T1U	CCTN-121	CN7-312	10TCU-T12
C202	15 NPO		NPO-DI 15	DTZ-15	C10Q15C	CCTO-150	CNO-415	10TCC-Q15
C203	30							
C204	15		NPO-DI 15	DTZ-15	C10Q15C	CCTO-150	CNO-415	10TCC-Q15
C205	.001		EF-001	MFT-1000		CCF-102	CT280A	
C206	1.8-7			829-7				
C207	100		EF-001	MFT-100				
C208	.5-3.5							
C209	33		NPO-DI 33	DTZ-33	C10Q33C	CCTO-330	CNO-433	10TCC-Q33
C210	.5-3.5							
C211	2.2 10%		NPO-SI 2.2	TCZ-2R2	C10V22C	CCTO-2R2	CNO-522	10TCC-V22
C212	100 N750 5%			DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C213	.001		BPD-001	DD-102	BYA10DI	CCD-102	GP210	10TS-D10
C214	6.8		NPO-DI 6.8	DTZ-6R8	C10V68C	CCTO-6R8	CNO-568	10TCU-V68
C215	18 N220					*		10TCR-Q18
C216	.001		EF-001	MFT-1000		CCF-102	CT280A	
C217	.001		EF-001	MFT-1000		CCF-102	CT280A	
C218	.001		EF-001	MFT-1000		CCF-102	CT280A	
C219	.001		EF-001	MFT-1000		CCF-102	CT280A	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R201	47K				R205	1000Ω			
R202	1000Ω				R206	4700Ω			
R203	4700Ω				R207	4700Ω			
R204	220K								

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	EMERSON PART No.	REPLACEMENT DATA
K201	Antenna Filter	470mmf, .3-1meg	963053	Centralab RC47I Sprague AC1-1
K202	Antenna Filter	470mmf, .3-1meg	963053	Centralab RC47I AC1-1

CABINETS & CABINET PARTS

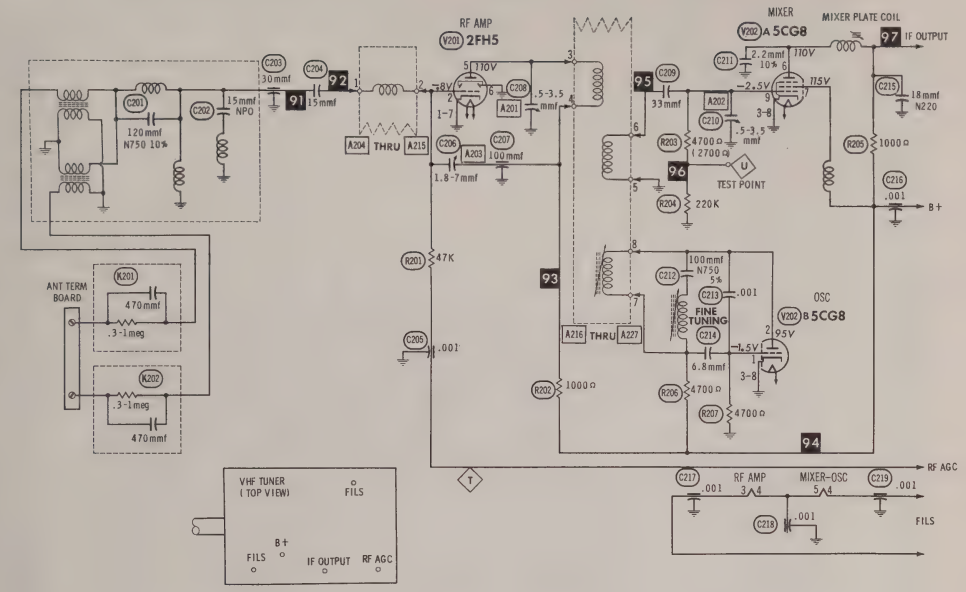
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

DESCRIPTION	PART NO.	MODEL NO. 1534A	1534B	1535A	1535B	1542	1543	1548	1549	1550	1551
Dial Glass-FM-AM Tuner	520301	X	X	X	X					X	X
Dial Pointer-FM-AM Tuner	525089	X	X	X	X					X	X
Mask-Gold	461331	X	X	X	X					X	X
Mask-Gold	461379					X	X	X			
Knob-VHF Channel Selector	461191B	X	X			X		X		X	
Knob-VHF Channel Selector	461192B			X	X		X		X		X
Knob-UHF Channel Selector	461396			X	X		X		X		X
Knob-UHF Channel Indicator	461270B			X	X		X		X		X
Knob-Fine Tuning, Clear	461201B	X	X	X	X					X	X
Knob-Fine Tuning, Clear	461201C					X	X	X	X		
Knob-Volume	461396	X	X	X	X	X	X	X	X	X	X
Collar-Volume Knob	461250	X	X	X	X	X	X	X	X	X	X
Knob-Contrast, Brt., V. Hold	461339	X	X	X	X	X	X	X	X	X	X
Knob-Radio Tuning, AM	461341	X	X	X	X					X	X
Knob-Radio Tuning, FM	461342	X	X	X	X					X	X
Knob-Radio, On-Off, Selector	461343	X	X	X	X					X	X
Knob-Loudness, Bass	461338	X	X	X	X					X	X
Knob-Balance, Treble	461337	X	X	X	X					X	X
Cabinet-Mahogany	141194	X		X							
Cabinet-Mahogany	141238A		X		X						
Cabinet-Mahogany	141228					X	X				
Cabinet-Mahogany	141173							X	X		

DESCRIPTION	PART NO.	MODEL NO. 1534A	1534B	1535A	1535B	1542	1543	1548	1549	1550	1551
Cabinet-Limed Oak	141194A	X		X							
Cabinet-Limed Oak	141238B		X		X						
Cabinet-Limed Oak	141173B								X	X	
Cabinet-Walnut	141194B	X		X							
Cabinet-Walnut	141238D		X		X						
Cabinet-Walnut	141228B					X	X				
Cabinet-Walnut	141173A								X	X	
Cabinet-Walnut	141205A										X X
Cabinet-Blond	141228A					X	X				
Cabinet-Maple	141205										X X
Leg-Cabinet, Maple *	620390										X X
Leg-Cabinet, Maple **	620391										X X
Leg-Cabinet, Walnut *	620390A										X X
Leg-Cabinet, Walnut **	620391A										X X
Leg-Cabinet, Mahogany	620378	X	X	X	X						
Leg-Cabinet, Mahogany	620383								X	X	
Leg-Cabinet, Limed Oak	620378A	X	X	X	X						
Leg-Cabinet, Limed Oak	620383B								X	X	
Leg-Cabinet, Walnut	620378B	X	X	X	X						
Leg-Cabinet, Walnut	620383A								X	X	
Leg-Cabinet, Brass	412410					X	X				
Plates-Cabinet Leg	414158					X	X				

* Right Front and Left Rear

** Left Front and Right Rear



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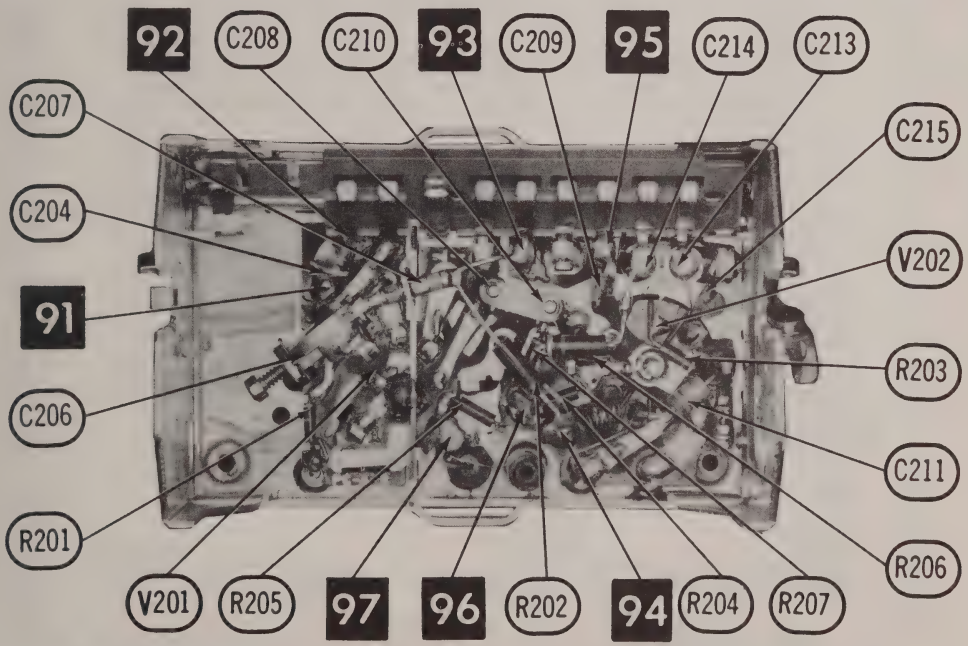
VHF TUNER 471230



A Howard W. Sams CIRCUITRACE Photo

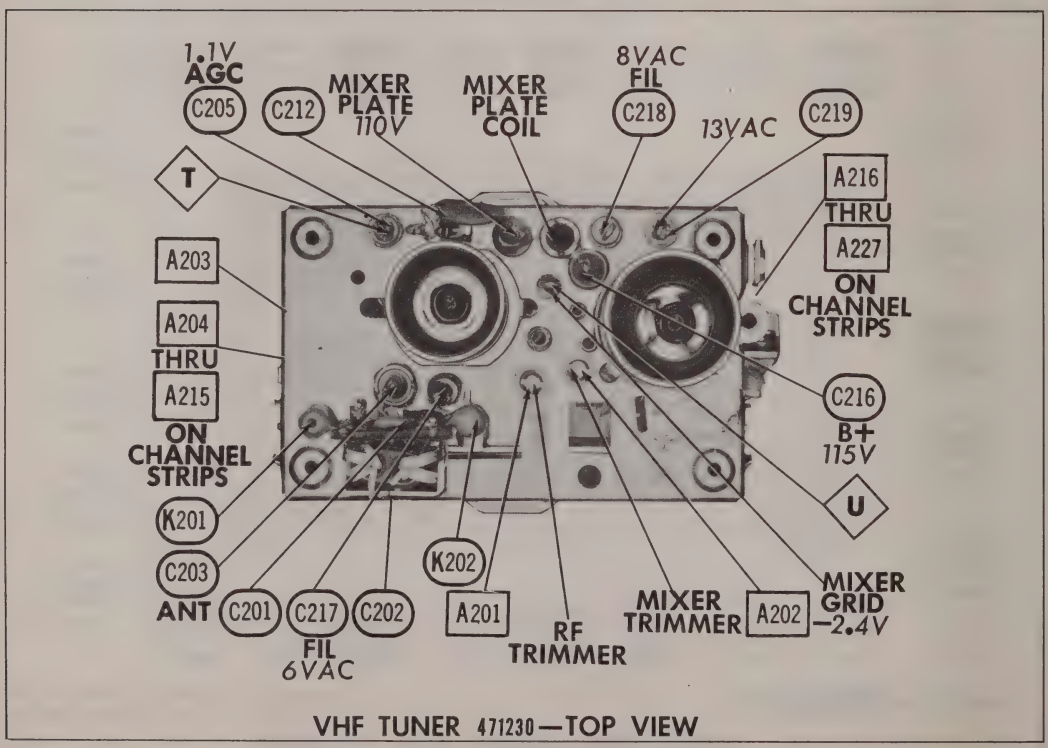
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

VHF TUNER 471230 - BOTTOM VIEW

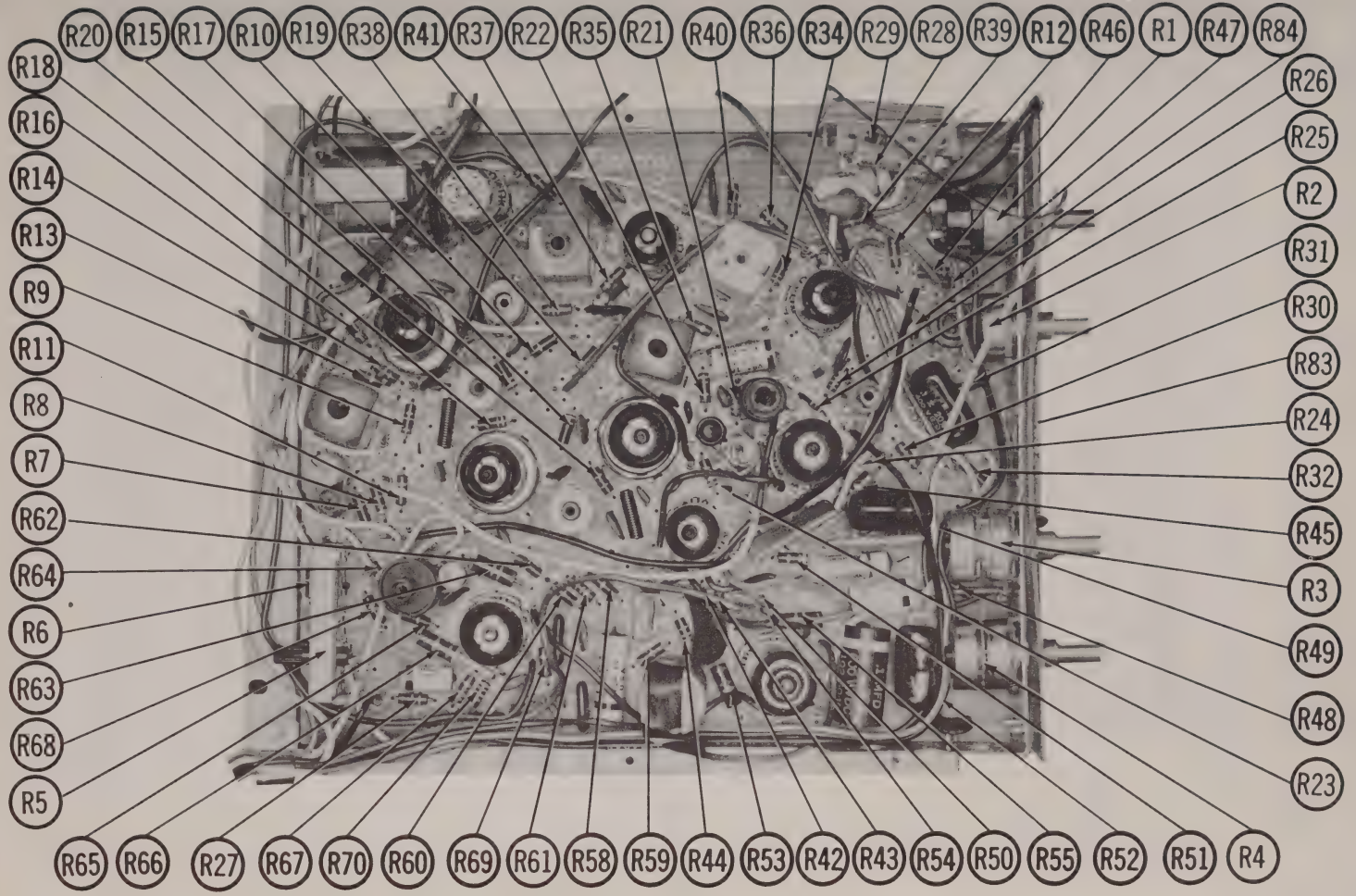
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3CB6	1.1meg	56Ω	6Ω	7Ω	†2500Ω	†2500Ω	0Ω		
V2	3CB6	1.1meg	47Ω	7Ω	8Ω	†2500Ω	†2500Ω	0Ω		
V3	5AS8	†2500Ω	.1Ω	180Ω	8Ω	10Ω	4700Ω	0Ω	.1Ω	†2500Ω
V4	8EB8	0Ω	•900K	•†5.5meg	16Ω	12Ω	•40Ω	350K	†4200Ω	†4700Ω
V5	3AU6	2.2Ω	0Ω	12Ω	11Ω	†2500Ω	†2500Ω	220Ω		
V6	3DT6	5.5Ω	560Ω	10Ω	11Ω	†220K	†4200Ω	560K		
V7	12CU5 12C5	180Ω	•100K	24Ω	30Ω	NC	†2000Ω	†2200Ω		
V8	3CS6	†825K	0Ω	16Ω	17Ω	†15K	†20K	2.1meg		
V9	8EM5	†20Ω	NC	NC	21Ω	17Ω	• 2.5meg	100Ω	NC	†340Ω
V10	6CG7	†100K	• 500K	1000Ω	24Ω	21Ω	†15K	1.1meg	1000Ω	0Ω
V11	12DQ6B	NC	35Ω	NC	†12K	250K	TP	40Ω	10Ω	TOP CAP †12Ω
V12	12AX4GTB	NC	NC	INF	NC	†20Ω	NC	35Ω	30Ω	
V13	1G3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †420Ω
V14	23YP4	0Ω	4700Ω	Pin 6 †20Ω	Pin 10 †20Ω	Pin 11 • 180K	Pin 12 3Ω			
V201	2FH5	0Ω	2.5meg -.1meg	3Ω	4Ω	†6900Ω	0Ω	0Ω		
V202	5CG8	4700Ω	†6900Ω	0Ω	6Ω	4Ω	†3200Ω	†2200Ω	0Ω	225K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

ALL MEASUREMENTS MADE WITH DISTANCE-NORMAL SWITCH IN NORMAL POSITION UNLESS OTHERWISE DESIGNATED.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM OUTPUT OF M1. ‡ MEASURED FROM PIN 3 OF V12.
- MEASURED WITH DISTANCE-NORMAL SWITCH IN DISTANCE POSITION. NC NO CONNECTION

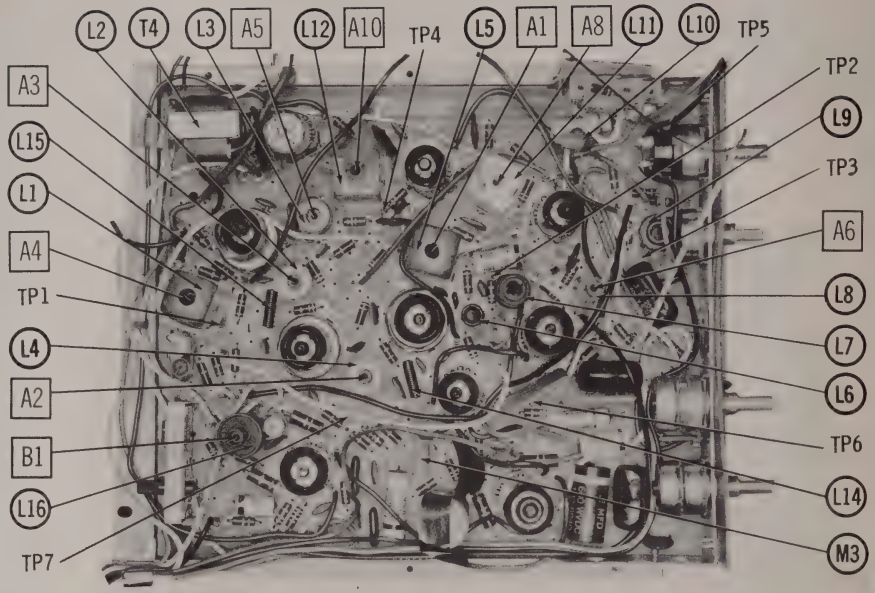


VHF TUNER 471230—TOP VIEW

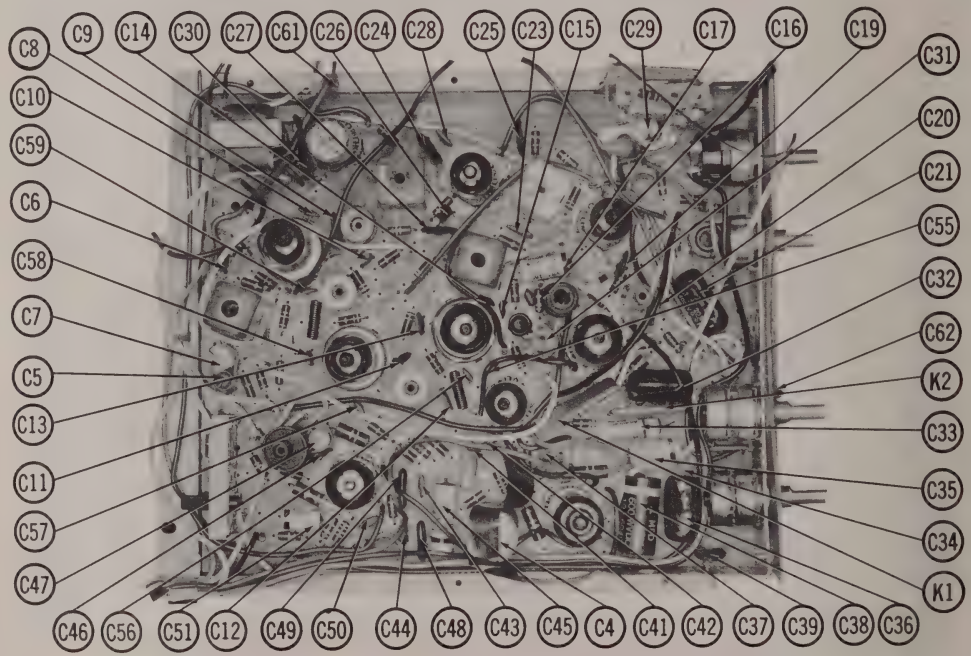


PRINTED BOARD - RESISTOR IDENT.

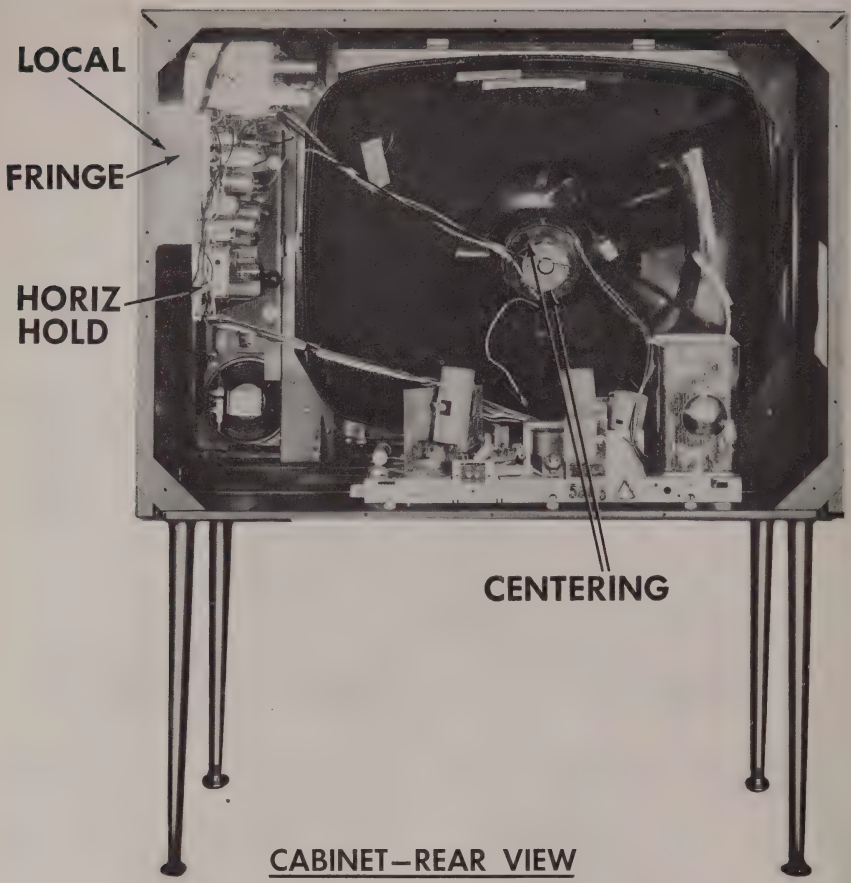
TP1	-1.1V	1st IF AGC	TP5	0V	AUDIO DET OUTPUT
TP2	-.8V	VIDEO DET OUTPUT	TP6	90V	SYNC SEP PLATE
TP3	185V	VIDEO OUTPUT PLATE	TP7	2.5V	HORIZ MULT CONTROL GRID
TP4	-6V	AUDIO DET QUAD COIL			



PRINTED BOARD - ALIGN., INDUCTOR, TRANSF., TEST POINT IDENT.



PRINTED BOARD - CAPACITOR, MISC. IDENT.



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Tune in a TV signal and set the Local - Fringe Switch to "Normal".

Connect a clip lead across the Horizontal Stabilizer Coil (L16). Connect another clip lead from TP-7 to chassis.

Adjust the Horizontal Hold until the picture synchronizes horizontally. (In most cases the picture will appear to float back and forth across the screen.)

Remove the clip lead from L16. Adjust the Horizontal Frequency Slug (B1) until the picture again synchronizes horizontally.

Remove the clip lead from TP-7 and chassis. The picture should then lock in solid.

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

POWER SUPPLY and SWEEP CHASSIS:

1. Remove 5 push-on type knobs on front panel.
2. Remove 17 screws in rear cover. Remove rear cover.
3. Remove 5 chassis screws.
4. Disconnect picture tube socket, yoke, and high voltage lead.
5. Pull chassis straight out.

IF and SOUND CHASSIS:

1. Remove 4 screws in chassis.
2. Remove speaker leads and pull chassis straight out.

PICTURE TUBE REMOVAL

It is necessary to remove both chassis for picture tube removal.

PHOTOFACT® Folder with CIRCUITRACE®

TRAV-LER MODELS 23FMSP 6195B, M, W (Ch. 1062-91, AM-FM1)

TRAV-LER MODELS 23FMSP 6195B, M, W (Ch. 1062-91, AM-FM1)

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

MODEL 23FMSP6195

M, W (Ch. 1062-91, AM-FM1)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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TRAV-LER MODELS 23FMSP 6195B, M, W (Ch. 1062-91, AM-FM1)

TRAV-LER MODELS 23FMSP 6195B, M, W (Ch. 1062-91, AM-FM1)

MODEL 23FMSP6195

TRADE NAME	Trav-Ler Model 23FMSP6195B, M, W (TV Chassis 1062-91); FM-AM Tuner (Chassis AM-FM 1)
MANUFACTURER	Trav-Ler Radio & Television Corp., 571 West Jackson Blvd., Chicago 6, Illinois
TYPE SET	Television Receiver (With Dual Channel Audio Amp., FM-AM Tuner, and 4 Speed Automatic Record Changer *)
TUBES	TV - Eighteen FM-AM Tuner - Six
POWER SUPPLY	110-120 Volts AC, 60 Cycle
RATING	TV: 215 Watts, 1.8 Amp. @ 117 Volts AC 150 Watts, 1.3 Amp. @ 117 Volts AC (Selector Switch in Radio Position) 125 Watts, 1.1 Amp. @ 117 Volts AC (Selector Switch in Phono Position, Less Motor)
TUNING RANGE	TV: Channels 2 thru 13 VHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier) FM-AM Tuner: BC - 540 to 1600KC (455KC IF) FM - 88 to 108MC (10.7MC IF)

* FOR SERVICE INFORMATION ON RECORD CHANGER - SEE SIMILAR UNIT - PHOTOFACT SET 465 FOLDER 2

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

Remove 3 screws holding the trim strip at the top edge of the safety glass. Tilt glass out and remove.

FUSE

A 3/4 Amp. fuse is used for LV power supply protection. (See "Tube Placement Chart" for location.)

A fuse wire is used for filament protection. (For location, see M2 in photo, page 17.)

TUNER OSCILLATOR ADJUSTMENT

To touch up the VHF Oscillator, remove Channel Selector and Fine Tuning knobs.

AGC

The AGC may be varied by means of an AGC Control. (See "Tube Placement Chart" for location.)

FOCUS

The focus may be varied by connecting the lead from pin 4 of the picture tube to various voltage points. (For location, see photo "Cabinet - Rear View".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

The Horizontal Frequency Slug is used for the Horizontal Hold. (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

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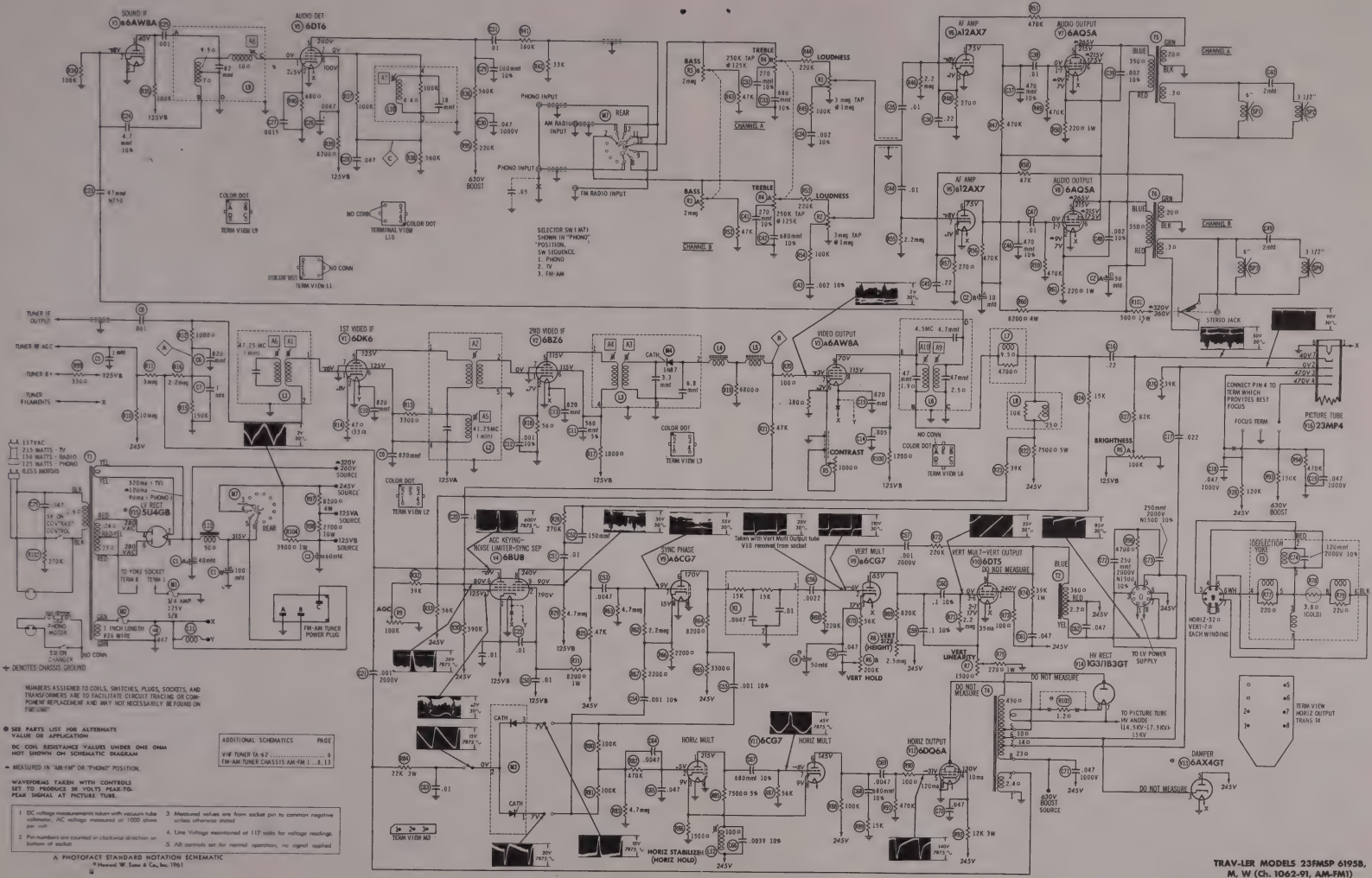
SOUND IF
AUDIO DET
AF AMP
AUDIO OUTPUT
TREBLE
BASS
LOUDNESS
PHONO INPUT
AM RADIO INPUT
FM RADIO INPUT
SELECTOR SW (M7) SHOWN IN "PHONO" POSITION. SW SEQUENCE. 1. PHONO 2. TV 3. FM-AM
CHANNEL A
CHANNEL B
TUNER IF OUTPUT
TUNER RF AGC
TUNER B+
TUNER FILAMENTS
1ST VIDEO IF
2ND VIDEO IF
VIDEO OUTPUT
CONTRAST
BRIGHTNESS
FOCUS TERM
PICTURE TUBE
AGC KEYING-NOISE LIMITER-SYNC SEP
SYNC PHASE
VERT MULT
VERT MULT-VERT OUTPUT
VERT HOLD
VERT SIZE (HEIGHT)
VERT LINEARITY
HORIZ MULT
HORIZ OUTPUT
DAMPER
HORIZ STABILIZER (HORIZ HOLD)
DEFLECTION YOKE
HV RECT
TO PICTURE TUBE HV ANODE
TO LV POWER SUPPLY
FM-AM TUNER POWER PLUG
TO YOKE SOCKET
117VAC
215 WATTS - TV
150 WATTS - RADIO
125 WATTS - PHONO
GLASS ENCLOSURE
DENOTES CHASSIS GROUND
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON PARTS LIST.
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
MEASURED IN "AM-FM" OR "PHONO" POSITION.
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
ADDITIONAL SCHEMATICS PAGE
VHF TUNER TA-92 8
FM-AM TUNER CHASSIS AM-FM 1 ..8, 13
1 DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1000 ohms per volt
2 Pin numbers are counted in clockwise direction on bottom of socket
3 Measured values are from socket pin to common negative unless otherwise stated
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied
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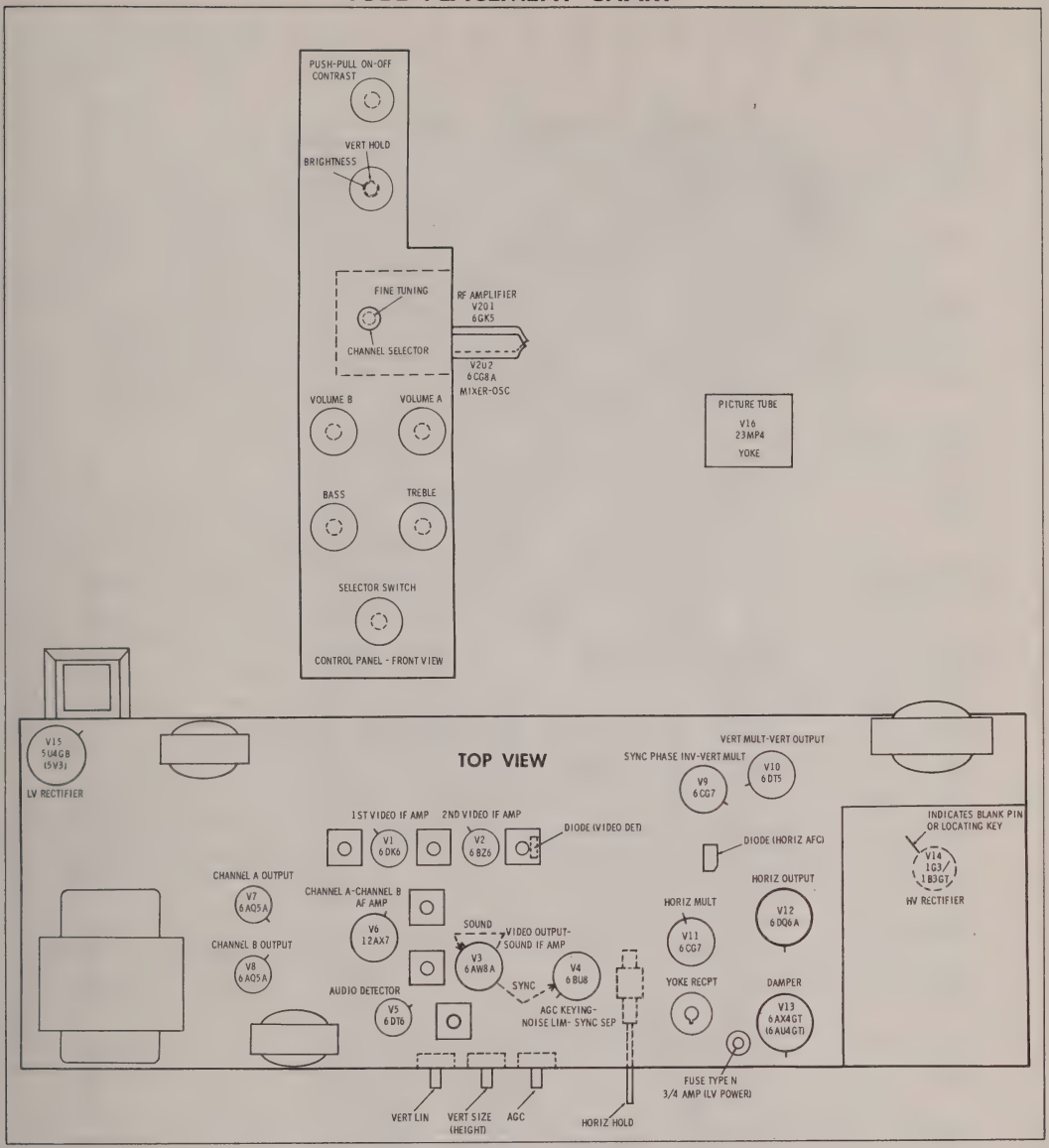
TRAV-LER MODELS 23FMSP 6195B, M, W (Ch. 1062-91, AM-FM1)

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

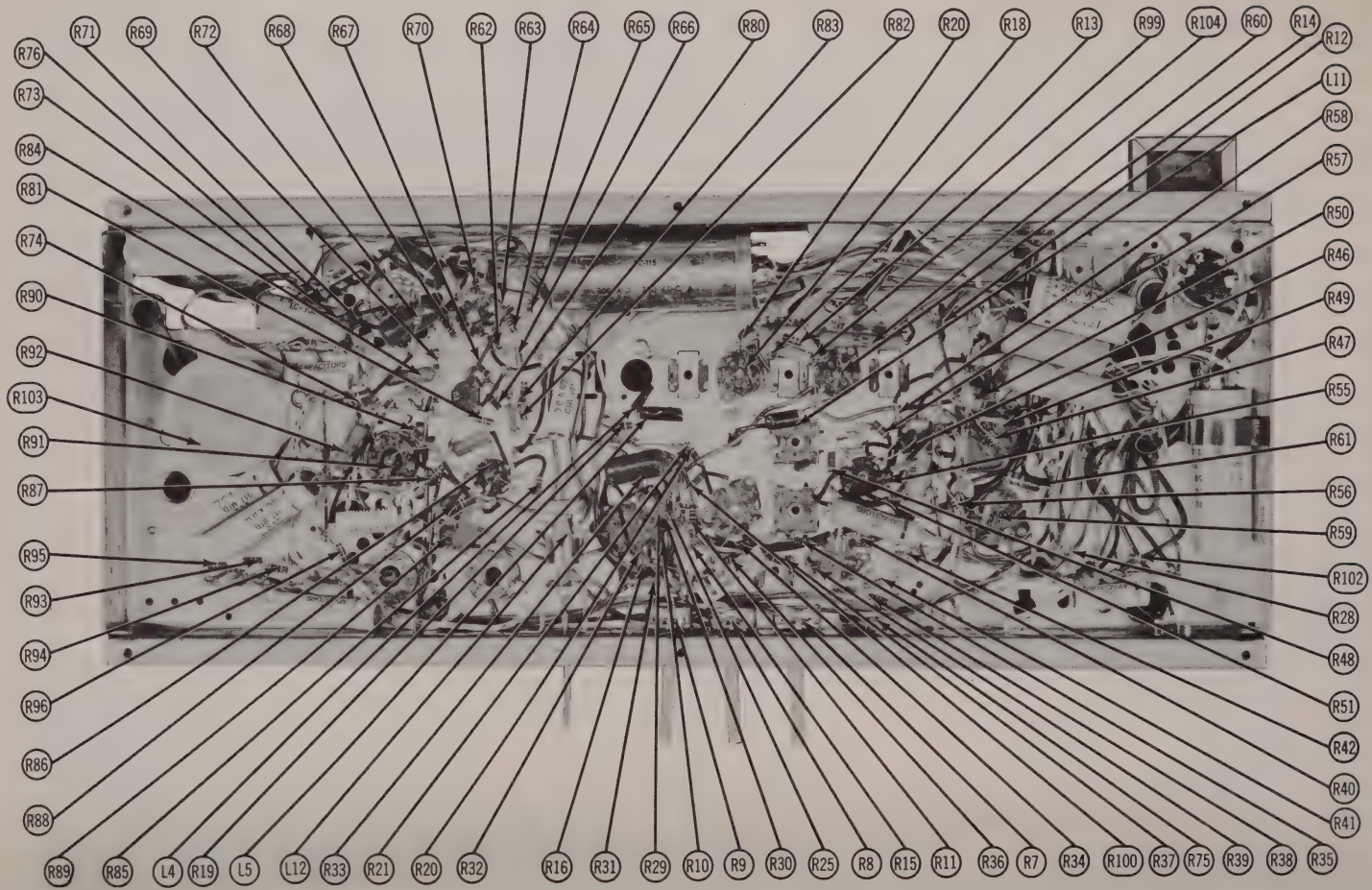
The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound V15, Fuse Wire (Fil.), Fuse (LV Power)

SWEEP FAILURE
No raster, has sound V11, V12, V13, V14, V16
No vertical deflection V9, V10
Poor vert. linearity or foldover V9, V10
Poor horiz. linearity or foldover V11, V12, V13
Narrow picture V11, V12, V13, V15
Vert. off freq. V9, V10
Horiz. off freq. Diode (Horiz. AFC), V11

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, Diode (Video Det.), V3
No pic, no sound, has snow V201, V202
No pic, has sound, has raster V3, V16
Has pic, no sound V3, V5, V6, V7 & V8
Overloaded picture V4

SYNC FAILURE
No vert. sync V4, V9
No horiz. sync V4, V9, Diode (Horiz. AFC)
No vert. or horiz. sync V4, V9



TV CHASSIS BOTTOM VIEW - RESISTOR, INDUCTOR IDENT.

ALIGNMENT INSTRUCTIONS
TV

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: A1 thru A4, A7 thru A10 ... GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545
A5, A6 ..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
Mixer Plate Coil ..... GENERAL CEMENT #9296, 9297
WALSCO #2546, 2547

VIDEO IF ALIGNMENT

Set Contrast fully clockwise and AGC fully counterclockwise.
Connect the negative lead of a 3 volt bias supply to point Ⓐ. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	Place a thin insulated metal strip between the Mixer-Osc. tube (V202), and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	44.0MC (10MC Swp)	41.25MC 45.75MC 47.25MC	Any non-interfering channel	Vert. Amp. thru 10K to point Ⓑ. Low side to chassis. (Across Video Det. load)	A1, A2, A3, A4, & Mixer Plate Coil	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Adjust Mixer Plate Coil and A2 to place 45.75MC marker at 50% on curve, A1 to correct low frequency side of curve, A3 for MINIMUM dip and A4 for proper tilt.
2.	"	"	"	41.25MC 47.25MC	"	"	A5, A6	Adjust A5 to place 41.25MC marker in proper trap notch. Adjust A6 to place 47.25MC marker in other trap notch.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	.05mfd	High side to point Ⓑ. Low side to chassis.	4.5MC (15KC Swp)	Any non-interfering channel	Across voice coil. Connect DC probe of VTVM to point Ⓒ. Common to chassis.	A7	Use high signal input. Set Volume for audible level. Adjust A7 for maximum audio on scope. If two peaks occur, select the one giving the highest meter reading.
4.	"	"	"	"	"	A8, A9	Reduce the signal level to the point where the audio on the scope starts to break up. Adjust A8 and A9 for cleanest maximum audio output on scope. Reduce the signal level still farther. Retouch A8 and A9 for cleanest maximum audio on scope.

SOUND IF ALIGNMENT USING AIR SIGNAL AND VTVM

Set the Contrast fully clockwise and tune in an air signal.
Connect the positive lead of the VTVM to point Ⓒ, negative lead to chassis.
Preset A7 fully counterclockwise. Next, turn A7 clockwise until a peak is obtained on the meter. The point of maximum undistorted sound as judged by listening, will occur slightly past this peak and will be between 2.5 and 3.5 volts on the meter. Tune A7 for maximum undistorted sound and not peak voltage.
Reduce the signal by disconnecting the antenna or detuning the Fine Tuning until the sound is distorted. Adjust A8 and A9 for maximum undistorted sound. Further reduce the sound and retouch A8 and A9. Continue reducing the signal and retouching A8 and A9 until optimum results are obtained. It may be necessary in some cases to retouch A7 for MINIMUM buzz at strong signal levels and A9 for cleanest sound at weak signal levels.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
5.	.05mfd	High side to point Ⓑ. Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe thru diode det. (Fig. 2) to pin 7 (cathode) of picture tube. Common to chassis.	A10	Adjust for MINIMUM deflection.

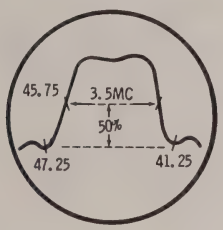


FIG. 1

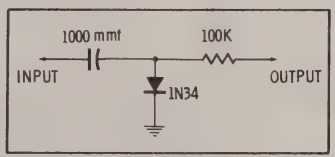
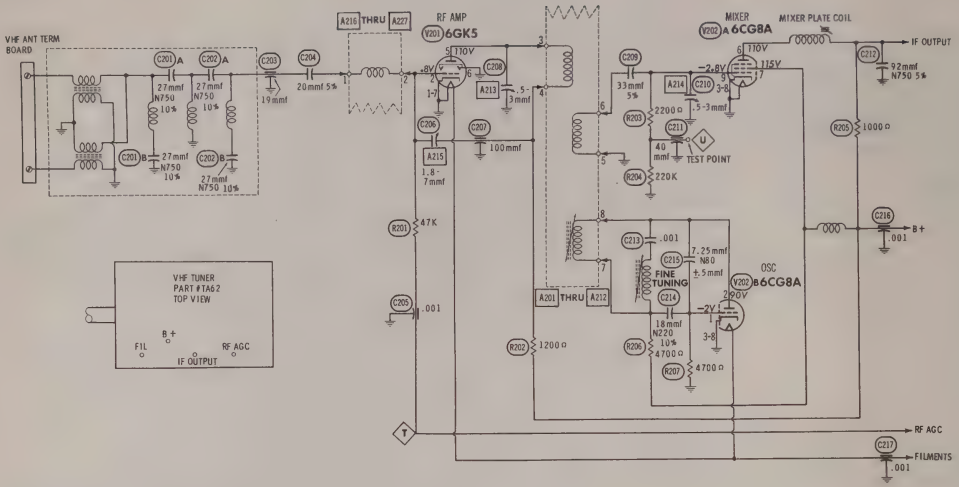


FIG. 2

ALIGNMENT IDENT. PHOTO PAGES 16, 17



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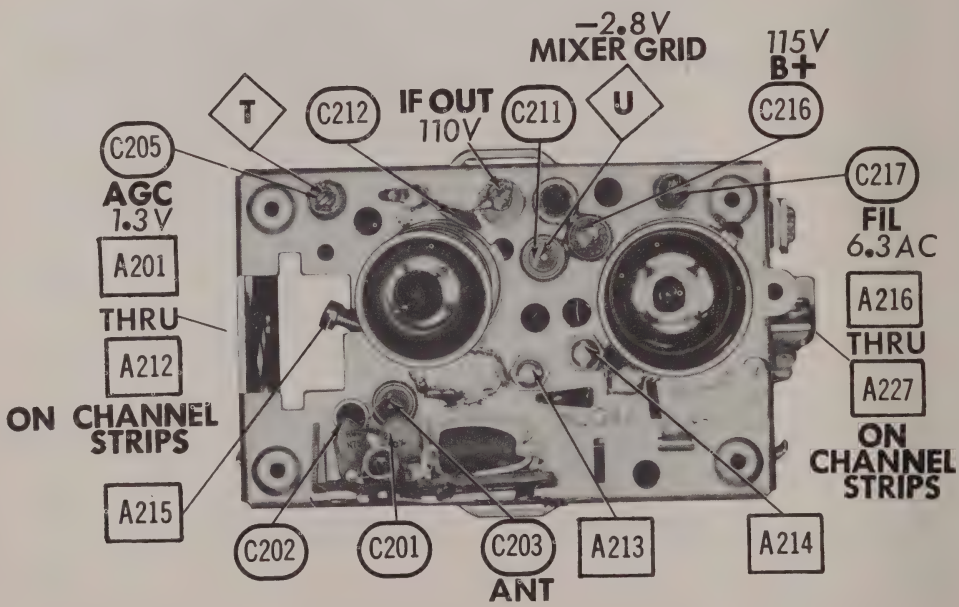
VHF TUNER TA-62



VHF TUNER - TOP VIEW

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: A201 thru A212 ..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531
A213, A214, A215..... GENERAL CEMENT #5000, 5003, 8276, 8290
WALSCO #2512, 2525

VHF OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.
Set the Fine Tuning to the center of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K across Video Det. load.	A201	Adjust to place sound marker in trap notch as in Fig. 201. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A202	
			201MC	199.25MC 203.75MC	11		A203	
			195MC	193.25MC 197.75MC	10		A204	
			189MC	187.25MC 191.75MC	9		A205	
			183MC	181.25MC 185.75MC	8		A206	
			177MC	175.25MC 179.75MC	7		A207	
			85MC	83.25MC 87.75MC	6		A208	
			79MC	77.25MC 81.75MC	5		A209	
			69MC	67.25MC 71.75MC	4		A210	
			63MC	61.25MC 65.75MC	3		A211	
			57MC	55.25MC 59.75MC	2		A212	

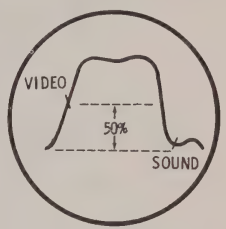


FIG. 201

VHF RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.
Connect the negative lead of a 4.5 volt bias supply to point (T). Positive to chassis.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
2.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point (U). Low side to chassis.	A213, A214, A215	Adjust A213 and A214 for maximum amplitude and symmetry with markers as shown in Fig. 202. Increase bias for MINIMUM amplitude of response curve. Without changing the bias adjust A215 to obtain MINIMUM response on the scope. Restore bias.
3.	"	"	213MC	211.25MC 215.75MC	13	"	A216	Adjust for maximum amplitude of response similar to Fig. 202. Adjust by compressing or expanding coil turns.
			207MC	205.25MC 209.75MC	12		A217	
			201MC	199.25MC 203.75MC	11		A218	
			195MC	193.25MC 197.75MC	10		A219	
			189MC	187.25MC 191.75MC	9		A220	
			183MC	181.25MC 185.75MC	8		A221	
			177MC	175.25MC 179.75MC	7		A222	
			85MC	83.25MC 87.75MC	6		A223	
			79MC	77.25MC 81.75MC	5		A224	
			69MC	67.25MC 71.75MC	4		A225	
			63MC	61.25MC 65.75MC	3		A226	
			57MC	55.25MC 59.75MC	2		A227	

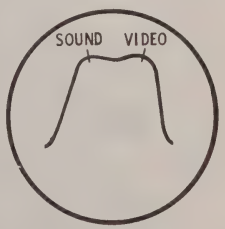
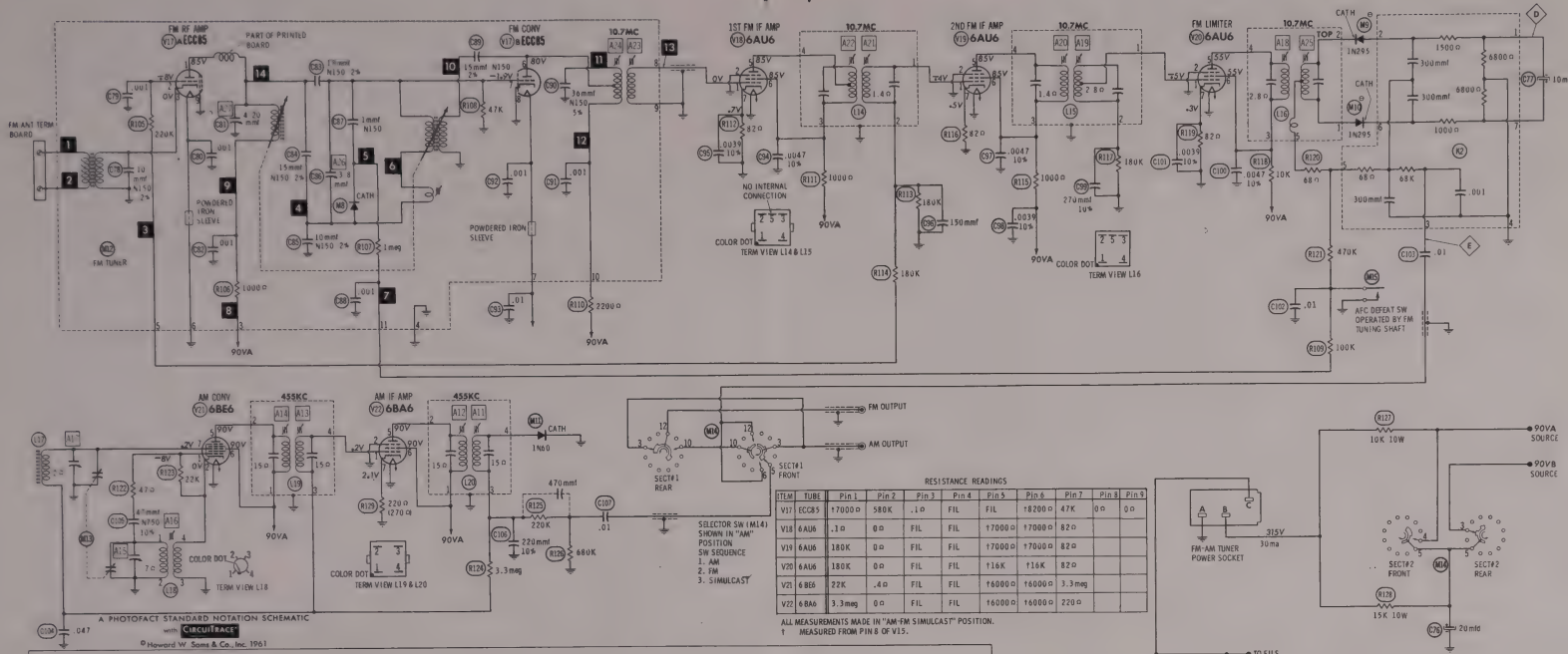


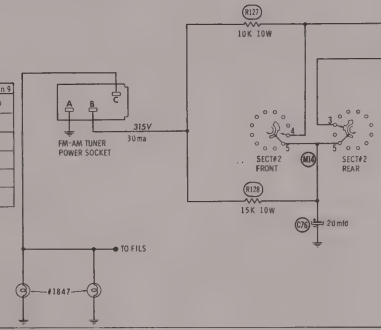
FIG. 202

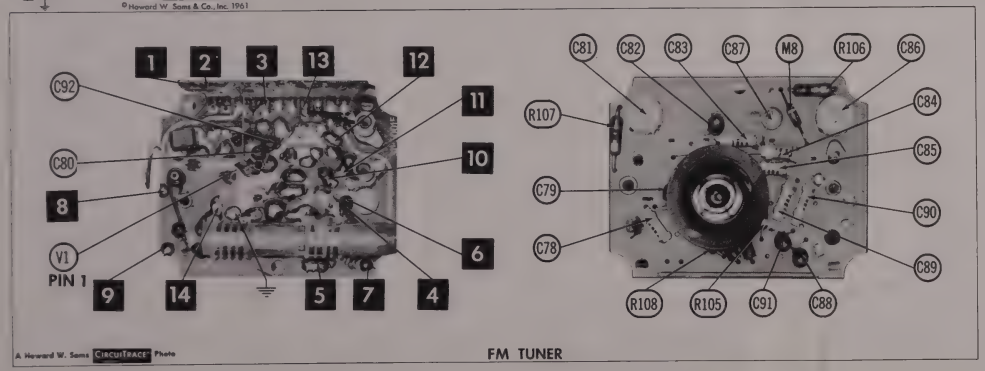


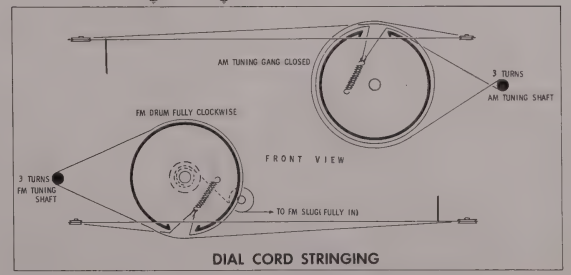
RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V17	ECC85	†7000Ω	580K	.1Ω	FIL	FIL	†8200Ω	47K	0Ω	0Ω
V18	6AU6	.1Ω	0Ω	FIL	FIL	†7000Ω	†7000Ω	82Ω		
V19	6AU6	180K	0Ω	FIL	FIL	†7000Ω	†7000Ω	82Ω		
V20	6AU6	180K	0Ω	FIL	FIL	†16K	†16K	82Ω		
V21	6BE6	22K	.4Ω	FIL	FIL	†6000Ω	†6000Ω	3.3meg		
V22	6BA6	3.3meg	0Ω	FIL	FIL	†6000Ω	†6000Ω	220Ω		

ALL MEASUREMENTS MADE IN "AM-FM SIMULCAST" POSITION.
† MEASURED FROM PIN 8 OF V15.







FM-AM TUNER CHASSIS AM-FM 1

TV PARTS LIST AND DESCRIPTIONS (Continued)

PHONO CARTRIDGE & NEEDLES

ITEM No.	REPLACEMENT DATA								NOTES
	TRAV-LER PART No.		ASTATIC PART No.		ELECTRO-VOICE PART No.		SONOTONE PART No.		
	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	
M5			17	N41 *	268	2604 * 2605 * (78RPM)	8TA4-S	N-8TA-S	-

MISCELLANEOUS

ITEM No.	PART NAME	TRAV-LER PART No.	NOTES
M6	Tuner	TA-62	VHF STANDARD COIL REPLACEMENT #GG-4230A
M7	Switch		Function Selector, Rotary Type

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

WIRING DATA

High Voltage Lead	Use BELDEN No. 8868
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor)
	8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors
	8534 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8474
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8494 (Round) – 4 Conductor
	8405 (Round) – 5 Conductor
	8488 (Round) – 8 Conductor

FM–AM TUNER PARTS LIST AND DESCRIPTIONS

TUBES

	GENERAL ELECTRIC	RAYTHEON	SYLVANIA	
ITEM No.	USE	TYPE		
V17	FM RF Amp. - FM Conv.	ECC85		
V18	1st FM IF Amp.	6AU6		
V19	2nd FM IF Amp.	6AU6		

ITEM No.	USE	TYPE
V20	FM Limiter	6AU6
V21	AM Converter	6BE6
V22	AM IF Amp.	6BA6

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA					
	CAP	VOLT	TRAV-LER PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C76	20	300	EC-70	PRS8660	BR3035	QT1-9	TC65	TD-20-350	TVA-1606
C77	10	10	EC-83	PTT39	NLW10-15	MT1-5	TC32	MLV10-10	TE-1114

FIXED CAPACITORS

ITEM No.	RATING			REMARKS	REPLACEMENT DATA					
					AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C78	10	N150	2%					*		
C79	.001				BPD-001	DD-102	BYA10DI	CCD-102	B-210	5HK-D10
C80	.001				BPD-001	DD-102	BYA10DI	CCD-102	B-210	5HK-D10
C81	4–20							*		
C82	.001				BPD-001	DD-102	BYA10DI	CCD-102	B-210	5HK-D10
C83	15	N150	2%					*		
C84	15	N150	2%					*		
C85	10	N150	2%					*		
C86	3–8							*		
C87	1	N150						*		
C88	.001				BPD-001	DD-102	BYA10DI	CCD-102	B-210	5HK-D10
C89	15	N150	2%					*		
C90	36	N150	2%					*		
C91	.001				BPD-001	DD-102	BYA10DI	CCD-102	B-210	5HK-D10
C92	.001				BPD-001	DD-102	BYA10DI	CCD-102	B-210	5HK-D10
C93	.01				BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-H10
C94	.0047		10%		DI-4700		PME104T	CCD-472	JL-347	10TS-D47
C95	.0039		10%		DI-4000		DPM8SD39	CCD-392	JL-339	10TS-D39
C96	150			DI-151	L10T15		CCD-151	GP315	10TS-T15	
C97	.0047		10%		DI-4700		PME104T	CCD-472	JL-347	10TS-D47
C98	.0039		10%		DI-4000		DPM8SD39	CCD-392	JL-339	10TS-D39
C99	270		10%	DI-271	L10T27		CCD-271	GP327	10TS-T27	
C100	.0047		10%		DI-4700		PME104T	CCD-472	JL-347	10TS-D47
C101	.0039		10%		DI-4000		DPM8SD39	CCD-392	JL-339	10TS-D39
C102	.01				BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-H10
C103	.01				BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-H10
C104	.047	200V			P488N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	ZTM-S47
C105	47	N750	10%		N750-2E 4T	DTN-47	C90A47U	CCTN-470	CNT-647	10TCU-C47
C106	220		10%		DI-221	DD-222	L10T22	CCD-221	GP323	10TS-T22
C107	.01				BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-H10

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	TRAV-LER PART No.	REPLACEMENT DATA
K2	Ratio Detector Network	300mmf, 300mmf, 300mmf, .001mfd, 68Ω, 1000Ω, 1500Ω, 6800Ω, 8800Ω, 68K	MC-61	Aerovox PA-694 Centralab PC-343 Sprague C-12

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R105	220K				R118	10K			
R106	1000Ω				R119	82Ω			
R107	1meg				R120	68Ω			
R108	47K				R121	470K			
R109	100K				R122	47Ω			
R110	2200Ω				R123	22K			
R111	1000Ω				R124	3.3meg			
R112	82Ω				R125	220K			
R113	180K				R126	680K			
R114	180K				R127	10K 10W	PW10-10K	10W-SQ-10K	
R115	1000Ω				R128	15K 10W	PW10-15K	10W-SQ-15K	
R116	82Ω				R129	220Ω			(270Ω) *
R117	180K								

* Alternate Value

COILS (RF-IF)

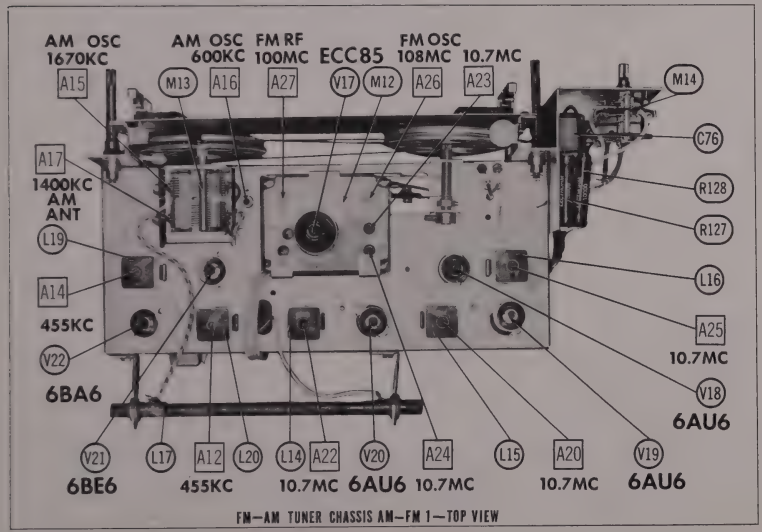
ITEM No.	USE	REPLACEMENT DATA					NOTES
		TRAV-LER PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L14	2nd FM IF	LI-32					
L15	3rd FM IF	LI-33					
L16	Ratio Detector	LI-34	FM-255	1465	RTC-8600	T635	
L17	Loopstick	LI-60	BC-519	705-A		T532	
L18	AM Osc.	LO-26	BC-393	TI-OSC	RTC-8648	T502	
L19	1st AM IF	LI-19	BC-352	13-C1	RTC-8632	T607	
L20	2nd AM IF	LI-19	BC-353	13-C2	RTC-8633	T608	

SIGNAL DIODES

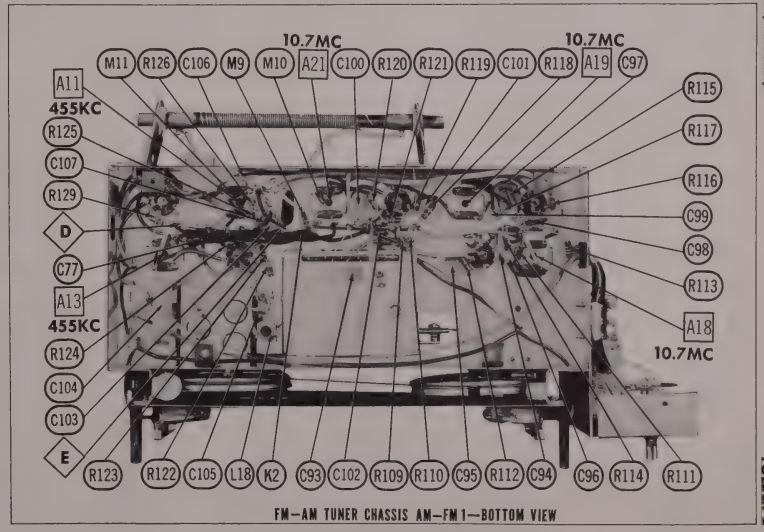
ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		TRAV-LER PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	
M8		*			* Special AFC Diode, (Part of FM Tuner TA-105)
M9	1N295 †			1N296	FM Detector Matched
M10	1N295 †			1N296	FM Detector Pair
M11	1N60			1N60	AM Detector
					† 1N542A or B Alternate.

MISCELLANEOUS

ITEM No.	PART NAME	TRAV-LER PART No.	NOTES
M12	Tuner	TA-105	FM Complete
M13	Tuning Cap		AM, 2 Gang, (Ant. 18-345mmf, Osc. 19-143mmf)
M14	Switch		Function Selector, Rotary Type
M15	Switch		AFC Defeat



FM–AM TUNER CHASSIS AM–FM 1—TOP VIEW



FM–AM TUNER CHASSIS AM–FM 1—BOTTOM VIEW

SET 556 FOLDER 2

TRAV-LER MODELS 23FMSP 6195B, M, W (Ch. 1062-91, AM-FM1)

FOLDER 2

TV PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	• GENERAL ELECTRIC • RAYTHEON • SYLVANIA • USE	TYPE
V1	1st Video IF Amp.	6DK8
V2	2nd Video IF Amp.	6BZ6
V3	Video Output - Sound IF Amp.	6AW8A
V4	AGC Keying - Sync Sep. - Noise Limiter	6BU8
V5	Audio Detector	6DT6
V6	Channel A - Channel B AF Amp.	12AX7
V7	Channel A Output	6AQ5A
V8	Channel B Output	6AQ5A
V9	Sync Phase Inverter - Vert. Mult.	6CG7
V10	Vert. Mult. - Vert. Output	6DT6
V11	Horiz. Mult.	6CG7
V12	Horiz. Output	6DQ6A
V13	Damper	6AX4GT (6AU4GT)*
V14	HV Rectifier	1G3/1B3GT
V15	LV Rectifier	5U4GB (5V3)*

* Alternate

PICTURE TUBE

ITEM No.	REPLACEMENT DATA: TRAV-LER PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
V16	23MP4	23MP4 ①			23MP4 ③	① Aluminized ③ Silver Screen "88"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP	VOLT	REPLACEMENT DATA: TRAV-LER PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1A	40	350	EC-115	AFH3-64-25	B0483	XC2-28	FP247	TMD-2700	TVL-2780
B	100	350							
C2A	50	350	EC-116A	AFH3-28-30	A0390	XC2-10	FP230.5	TMS-1630	TVL-1632
B	10	350			B0048			TD-10-450	TVA-1604
C3	60	300	EC-131	PRH590	RH6025	QTI-15	TC68	TD-60-350	TVA-1513
C4	50 ①	50	EC-130 ①	PRH590	RH505	QTI-15	TC39	TD-50-50	TVA-1308

① Some versions may use 10mfd ③ 50V (Part #EC-129).

FIXED CAPACITORS

ITEM No.	RATING		REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C1	1.0	100V		P288N-1.0		CUB2W1	1DP-5-105	GEM-21	2TM-P10
C2	820			DI-820	DD-821	BYA10T82	CCD-821	B-382	10TS-T82
C3	1.0	100V		P288N-1.0		CUB2W1	1DP-5-105	GEM-21	2TM-P10
C4	.001			BPD-001	DD-102	BYA10N	CCD-102	B-210	5HK-D10
C5	820			DI-820	DD-821	BYA10T82	CCD-821	B-382	10TS-T82
C6	820			DI-820	DD-821	BYA10T82	CCD-821	B-382	10TS-T82
C7	560	5%				SR5T56	CM-19B-561J	MC1247	MS-358
C8	.001	10%		DI-1000	DD-102	SR5D1	CCD-102	GP210	5HK-D10
C9	820			DI-820	DD-821	BYA10T82	CCD-821	B-382	10TS-T82
C10	.005			BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C11	820			DI-820	DD-821	BYA10T82	CCD-821	B-382	10TS-T82
C12	.22	400V		P488N-22		CUB4P22	4DP-5-224	GEM-4022	4TM-P22
C13	.022	600V		P668N-.022	DD-203	CUB6S22	6DP-2-223	GEM-6122	6TM-S22
C14	.047	1000V		P10S8N-047		CUB10S47	10DP-5-473	GEM-10147	10TM-S47
C15	.047	1000V		P10S8N-047		CUB10S47	10DP-3-473	GEM-10147	10TM-S47
C16	.1	600V		P668N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10
C17	.001	3000V		HVB-30-1000	DD30-102	HVB20D1	3CCD-102	2HV-220	BL-D20
C18	.01			BPD-01	DD-103	BYA10S1	CCD-103	B-310	5HK-S10
C19	47	N750		N750-DI 47	DTN-47	CI0Q47U	CCTN-470	CN7-447	10TCU-Q47
C20	4.7	10%		NPO-DI 4.7	TCZ-4R7	CI0V47U	CCTO-4R7	CNO-547	10TCC-V47
C21	.001			BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C22	.0047			BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C23	.0015			BPD-0015	DD-152	BYA10D15	CCD-152	B-215	5HK-D15
C24	.047	200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C25	100	10%		DI-100	DD-101	L10T1	CCD-101	GP310	10TS-T10
C26	.047	1000V		P10S8N-047		CUB10S47	10DP-3-473	GEM-10147	10TM-S47
C31	.01			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C32	270			DI-270	DD-271	L10T27	CCD-271	GP327	10TS-T27
C33	680	10%		DI-680	DD-681	SR5T68	CCD-681	GP368	10TS-T68
C34	.002	10%		DI-2000		SR5D2	CCD-202	GP220	10TS-D20
C35	.01			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C36	.22	100V		P288N-22		CUB2P22	1DP-3-224	GEM-2022	2TM-P22
C37	470	10%		DI-470	DD-471	SR5T47	CCD-471	GP347	10TS-T47
C38	.01			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C39	.002	10%		DI-2000		SR5D2	CCD-202	GP220	10TS-D20
C40	2mfd	100V		P282Z-2.0		WM2W2E			
C41	270	10%		DI-270	DD-271	L10T27	CCD-271	GP327	10TS-T27
C42	680	10%		DI-680	DD-681	SR5T68	CCD-681	GP368	10TS-T68
C43	.002	10%		DI-2000		SR5D2	CCD-202	GP220	10TS-D20
C44	.01			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C45	.22	100V		P288N-22		CUB2P22	1DP-3-224	GEM-2022	2TM-P22
C46	470	10%		DI-470	DD-471	SR5T47	CCD-471	GP347	10TS-T47
C47	.01			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C48	.002	10%		DI-2000		SR5D2	CCD-202	GP220	10TS-D20
C49	2mfd	100V		P282Z-2.0		WM2W2E			
C50	.01			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C51	.01			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C52	150			DI-150	DD-151	L10T15	CCD-151	GP315	10TS-T15
C53	.0047			BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C54	.001	10%		DI-1000	DD-102	SR5D1	CCD-102	GP210	10TS-D10
C55	.001	10%		DI-1000	DD-102	SR5D1	CCD-102	GP210	10TS-D10
C56	.0033			BPD-0033	DD-222	BYA10D22	CCD-222	B-222	5HK-D22
C57	.001	2000V		HVB-30-1000	DD30-102	HVB20D1	3CCD-102	2HV-210	BL-D20
C58	.047	200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	6TM-S47
C59	.1	600V	10%	V84CSDL-10%		PM6P1	6DP-4-104	GEM-1001	6TM-P10
C60	.1	600V	10%	V84CSDL-10%		PM6P1	6DP-4-104	GEM-1001	6TM-P10
C61	.047	600V		P668N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C62	.047	600V		P668N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C63	.01	600V		P668N-01	DE-103	CUB6S1	6DP-3-103	GEM-611	6TM-S10
C64	.0047			BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C65	.047	600V		P668N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C66	.0039	10%		DI-0039		1N5D39	CM-19D-392K	JL-239	MS-239
C67	680	10%		DI-680	DD-681	SR5T68	CM-19B-681K	GP368	MS-368
C68	680	10%		DI-680	DD-681	SR5T68	CM-19B-681K	GP368	MS-368
C69	.0047			BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C70	.047	600V		P668N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C71	.047	1000V		P10S8N-047		CUB10S47	10DP-5-473	GEM-10147	10TM-S47
C72	250	2000V	N1500 10%						
C73	250	2000V	N1500 10%						
C74	120	2000V	10%						
C75	.047	600V		P668N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47

CONTROLS

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: TRAV-LER PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	* CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	3meg Lmg Tap	½	VC-344			Q3-140X	UT-457	Loudness, Channel A
R2	3meg Lmg Tap	½	VC-344			Q3-140X	UT-457	Loudness, Channel B
R3A	2meg	½	VC-348	B-75	AD47-2meg-B		FA26L	Bass, Channel B
B	2meg	½		SR-75	Not Req.		RU26L	Bass, Channel A
C	Shaft			Not Req.	KSS-3		CS3500	
R4A	250K	½	VC-347	BT-56			FA2547I253	Treble, Channel B
B	125K Tap	½		STR-56			RU2547I253	Treble, Channel A
C	Shaft			Not Req.			CS3500	
R5A	1000Ω	½	VC-345			B17-108	PP13R	Contrast
B	Switch					SW7	Not Req.	Push-Pull Off-On
R6A	100K	½	VC-346	F1-31				Brightness
B	200K	½		R2-33		† QU-1557	■	Vert. Hold
R7A	1500Ω	½	VC-85A	TT-511	B47-1500-b	B11-109	PTA152L	Vert. Linearity
B	Shaft			Not Req.	Not Req.	TM4	Not Req.	
R8	2.5meg	½	VC-78	TT-43	B47-2.5meg-A	HLC-2	SU-565	Vert. Size (Height)
R9A	100K	½	VC-84	TT-40	B47-100K-s	B11-128	PTA15L	AGC
B	Shaft			Not Req.	Not Req.	TM4	Not Req.	

† "CONCENTRIKIT" Equivalent: K-6 Kit with Base Elements and Shafts: B11-128, P17-113 (Panel)
(Not available as a factory assembled unit): B11-129, R1-126 (Rear)
■ "STA-LOC" Equivalent: FA2R1, RU25L, CF1375, 151875.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise used.

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R10	10meg			
R11	3meg			
R12	1000Ω			
R13	3300Ω			
R14	47Ω			(33Ω) *
R15	150K			
R16	2.2meg			
R17	1800Ω			
R18	56Ω			
R19	6800Ω			
R20	100Ω			
R21	47K			
R22	7500Ω 5W	PW5-7500	5W-SQ-7500	
R23	39K			
R24	15K			
R25	47K			
R26	270K			
R27	62 K			
R28	120K			
R29	4.7meg			
R30	390K			
R31	8200Ω 1W			
R32	39K			
R33	56K			
R34	100K			
R35	100K			
R36	560K			
R37	100K			
R38	560K			
R39	8200Ω			
R40	6800Ω			
R41	180K			
R42	33K			
R43	47K			
R44	220K			
R45	100K			
R46	2.2meg			
R47	470K			
R48	270Ω			
R49	470K			
R50	220Ω 1W			
R51	470K			
R52	47K			
R53	220K			
R54	100K			
R55	2.2meg			
R56	470K			
R57	270Ω			

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R58	47K			
R59	470K			
R60	8200Ω 4W	PW4-8200	4G-8200	
R61	220Ω 1W			
R62	2.2meg			
R63	4.7meg			
R64	8200Ω			
R65	3300Ω			
R66	2200Ω			
R67	2200Ω			
R68	220K			
R69	820K			
R70	56K			
R71	2.2meg			
R72	220K			
R73	100Ω			
R74	39K 1W			
R75	220Ω 1W			
R76	39K			
R77	220Ω			
R78	3.8Ω (Cold)			
R79	220Ω			
R80	100K			
R81	100K			
R82	470K			
R83	4.7meg			
R84	22K 3W	PW3-22K	3G-22K	
R85	75000Ω 5%			
R86	1500Ω			
R87	56Ω			
R88	100K			
R89	15K			
R90	100Ω			
R91	470K			
R92	12K 3W	PW3-12K	3G-12K	
R93	150K			
R94	470K			
R95	220K			
R96	4700Ω			
R97	8200Ω 4W	PW4-8200	5W-SQ-8200	
R98	2700Ω 10W	PW10-2700	10W-SQ-2700	
R99	330K			
R100	1200Ω			
R101	500Ω 15W	PW15-500	15W-SQ-500	
R102	270K			
R103	1.2Ω			Note 1
R104	3900Ω 1W			

* Alternate Value

Note 1. May not be used in some versions.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	REPLACEMENT DATA: TRAV-LER PART No.	REPLACEMENT DATA
K1	Vert. Integrator	.0047mfd, .01mfd, 15K, 15K	CC-120	Centralab PC-392

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: TRAV-LER PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	NOTES
L1A	1st Video IF	L-179	TV-129	6233 ▲	RTC-8561 ▲	T210 ▲	① Includes Complete Assy.
B	47.25MC Trap						② Wound on 4700Ω Resistor.
L2A	2nd Video IF	L-103	TV-127	6232	RTC-8559	T209	③ Wound on 10K Resistor.
B	41.25MC Trap						④ Includes 100K Resistor, 18mmf Capacitor.
L3	3rd Video IF	L-152 ①				T276	▲ Disregard Secondary.
L4	RF Choke (10uh)	L-160	BC-566	4612	RTC-8522	T860	† Parallel with 4700Ω Resistor.
L5	RF Choke (27uh)	L-158	TV-192	4515	RTC-8525	T863	■ Parallel with 10K Resistor.
L6A	4.5MC Trap	L-154		1482 IFT	RTC-9056	T253	* Parallel with 100K Resistor.
B	Sound Takeoff						
L7	Peaking (180uh)	L-182 ②		TV-194 †	6180 †	RTC-8597 †	T359
L8	Peaking (950uh)	L-163 ③		TV-208 ▲	6157 ▲	RTC-8598 ▲	T361
L9	Sound IF	L-167					TA232
L10	Quadrature	L-110-A ④		TV-154 *	1481 *	RTC-8606 *	T248 *
L11	Fil. Choke (1.5uh)	L-184	BC-562	4604	RTC-8516		T856

COILS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: TRAV-LER PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	Workman TV PART No.	NOTES
L12	Horiz. Stabilizer (Horiz. Hold)	L-156	TV-163	6210	RTC-8622	128-8	WLC-25	T103	

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA: TRAV-LER PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
L13	.35A	50Ω	1.1 Hy.	FC-5	C-2994	C-2343	28C44	C-34X	

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	SEC. 1	SEC. 2	REPLACEMENT DATA: TRAV-LER PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No	NOTES
T1	117V ② 1.8A	560VCT @ 320A DC	5V ② 3.8A	TR-63					
	SEC. 3	SEC. 4	SEC. 5						
	6.3V ② 10.5A								

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: TRAV-LER PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Tried PART No.	NOTES
T2	Vert. Output	TR-50A			26S14	A-140X	
T3	Yoke (Horiz. 18.6MH) (116Ω) (Vert. 12.5MH)	L-174C	MDF-120 ①	DY-27A ②	Y-52 ②	Y-60-1	
T4	Horiz. Output	TR-51	HVO-152 *	HO-304 *	FLY-137 *	D-151R *	

① Connect Yoke Terminal #5 to Yoke Plug Pin #5; Yoke Terminals #4 and #6 to Yoke Plug Pin #4; Yoke Terminal #6 to Yoke Plug Pin #6. ②Requires new rear cover and centering device.

***HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA**

ORIGINAL TERMINAL CONNECTIONS	Merit Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
2	2	2	1	2
1	1	1	2	1

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC.	REPLACEMENT DATA: TRAV-LER PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	9500Ω	3-4Ω	AT-47					
		SEC. 2 170Ω						
		SEC. 1						
T6	9500Ω	3-4Ω	AT-47					
		SEC. 2 170Ω						

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: TRAV-LER PART No.	QUAM PART No.	NOTES
SP1	6"	PM	3-4Ω	SPK-62	6A31	
SP2	5¼"	PM	3-4Ω	SPK-28	3A15TZ4.7	
SP3	6"	PM	3-4Ω	SPK-62	6A31	
SP4	3½"	PM	3-4Ω	SPK-28	3A15TZ4.7	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: TRAV-LER PART No. FUSE	HOLDER	LITTELFUSE PART No. FUSE	HOLDER	BUSS PART No. FUSE	HOLDER
M1	N	3/4A 125V 3/8	F13		333.750 (N 3/4A 125V 3/8)	346010	N 3/4	HN 1/2 to 3/4
M2	1 inch	length	#26 wire					

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: TRAV-LER PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	NOTES
M3		SR-15 *	6GD1 *		* Horizontal AFC Diode, Dual Selenium, Series Connected
M4	1N87	1N87 †		1N87 †	† Video Detector (Part of Detector Assembly)

TRAV-LER MODELS 23FMSP 6195B, M, W (Ch. 1062-91, AM-FM1)

FOLDER 2

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:

All thru A14, A16, A18, A19, A20, A23	GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440 WALSCO #2526, 2543, 2544, 2545
A15, A17	GENERAL CEMENT #5004, 5008, 5009 WALSCO #2520
A21, A22	GENERAL CEMENT #9440
A24, A25	GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089 WALSCO #2512, 2525, 2528

AM ALIGNMENT — SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .05mfd to pin 7 (grid) of AM Converter. Low side to chassis.	455KC (400~ 30% AM)	(AM) Tuning gang fully open.	Across voice coil.	A11, A12, A13, A14	Adjust for maximum output.
2.	Loop	1670KC	"	"	A15	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	600KC	600KC	"	A16	"
4.	"	1400KC	1400KC Signal.	"	A17	Adjust for maximum output. Repeat Steps 2, 3 and 4.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM — SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	Across FM antenna terminals.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe to point Ⓓ. Common to chassis.	A18, A19, A20, A21, A22, A23, A24	Adjust for maximum deflection.
6.	"	"	"	DC probe to point Ⓔ. Common to chassis.	A25	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE—SELECTOR IN FM POSITION

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5.	Across FM antenna terminals.	10.7MC (450KC Swp)	(FM) Point of non-interference.	Vert. amp. to point Ⓓ. Low side to chassis.	A18, A19, A20, A21, A22, A23, A24	Disconnect Stabilizing Capacitor C77. Adjust for maximum gain and symmetry of response similar to Fig. 3 with markers as shown. Reconnect C77.
6.	"	"	"	Vert. amp. to point Ⓔ. Low side to chassis.	A25	Adjust to place marker at the center of crossover lines similar to Fig. 4. SLIGHTLY retouch A18 for maximum amplitude and straightness of cross-over lines.

FM RF ALIGNMENT — SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	Across FM antenna terminals with 150Ω in each lead.	108.5MC (Unmod.)	(FM) High end stop.	DC probe to point Ⓓ. Common to chassis.	Idler Tension Screw, and A26	Adjust for maximum deflection.
8.	"	100MC	100MC	"		Retouch Idler Tension screw for maximum deflection.
9.	"	100MC	"	"	A27	Adjust for maximum deflection.

FIG. 3

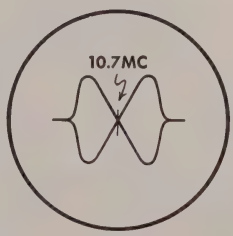


FIG. 4

ALIGNMENT IDENT. PHOTOS PAGES 9, 12

VHF TUNER PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
	◆ GENERAL ELECTRIC ◆		RAYTHEON ◆	SYLVANIA ◆	
V201	RF Amp.	6GK5	V202	Mixer - Osc.	6CG8A

FIXED CAPACITORS

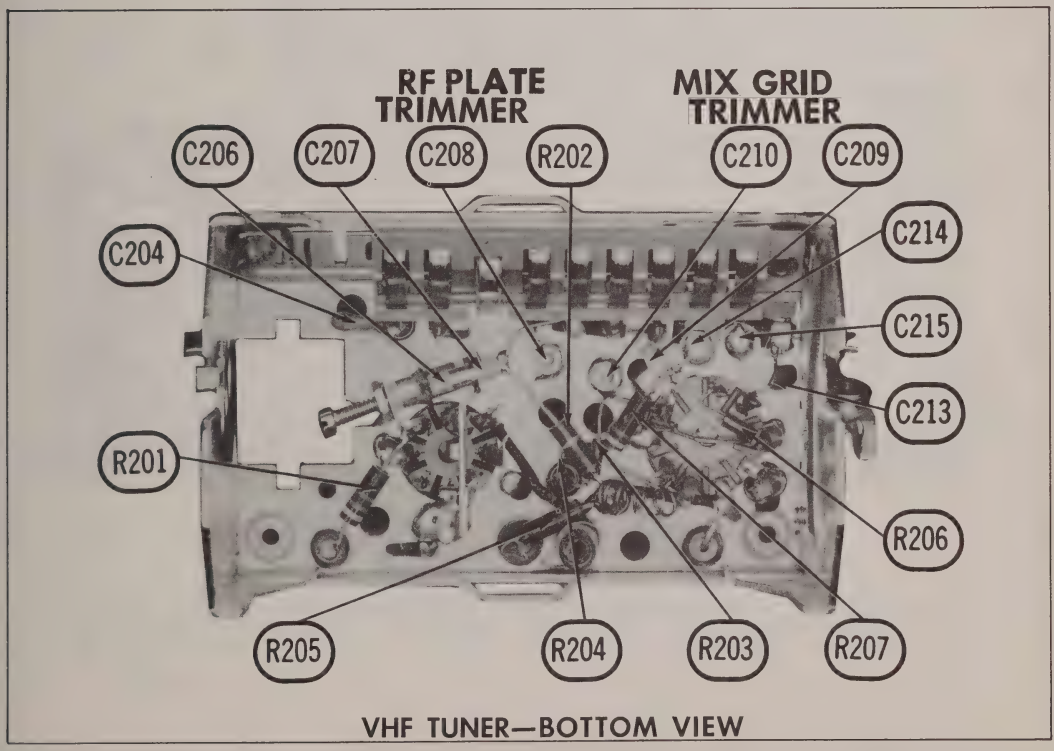
ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201A	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
B	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C202A	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
B	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C203	19							
C204	20 5%			DTZ-20	C10Q20C	CCTO-200		10TCC-Q20
C205	.001		EF-001	MFT-1000		CCF-102	CNO-422	
C206	1.8-7			829-7			CT280A	
C207	100		EF-0001	MFT-100				
C208	.5-3			829-3		CV-1	CT565	
C209	33 5%			NPO-SI 33	C10Q33C		CNO-433	10TCC-Q33
C210	.5-3			829-3		CV-1	CT565	
C211	40							
C212	92 N750 5%			TCN-91	C10Q92U			
C213	.001		BPD-001	MFT-1000		CCF-102	CT280A	
C214	18 N220 10%					*		10TCP-Q18
C215	7.25 N80 ±.5mmf					*		
C216	.001		EF-001	MFT-1000		CCF-102	CT280A	
C217	.001		EF-001	MFT-1000		CCF-102	CT280A	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

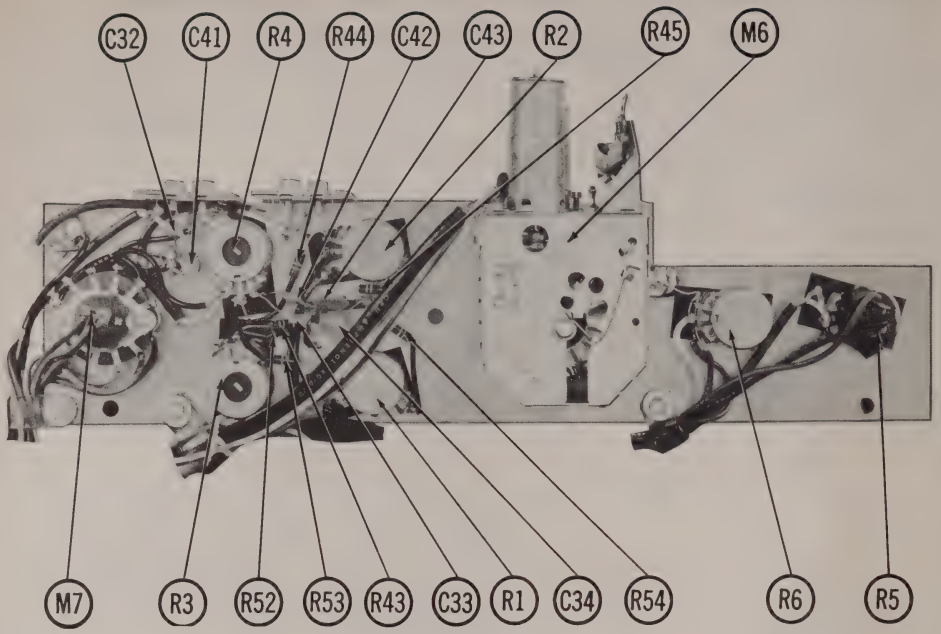
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

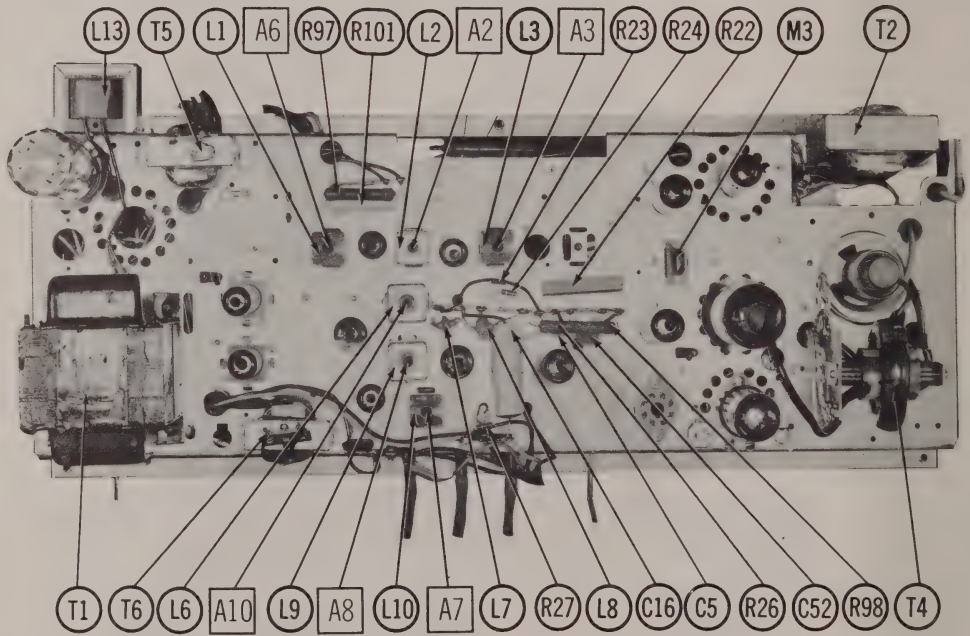
ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R201	47K				R205	1000Ω			
R202	1200Ω				R206	4700Ω			
R203	2200Ω				R207	4700Ω			
R204	220K								



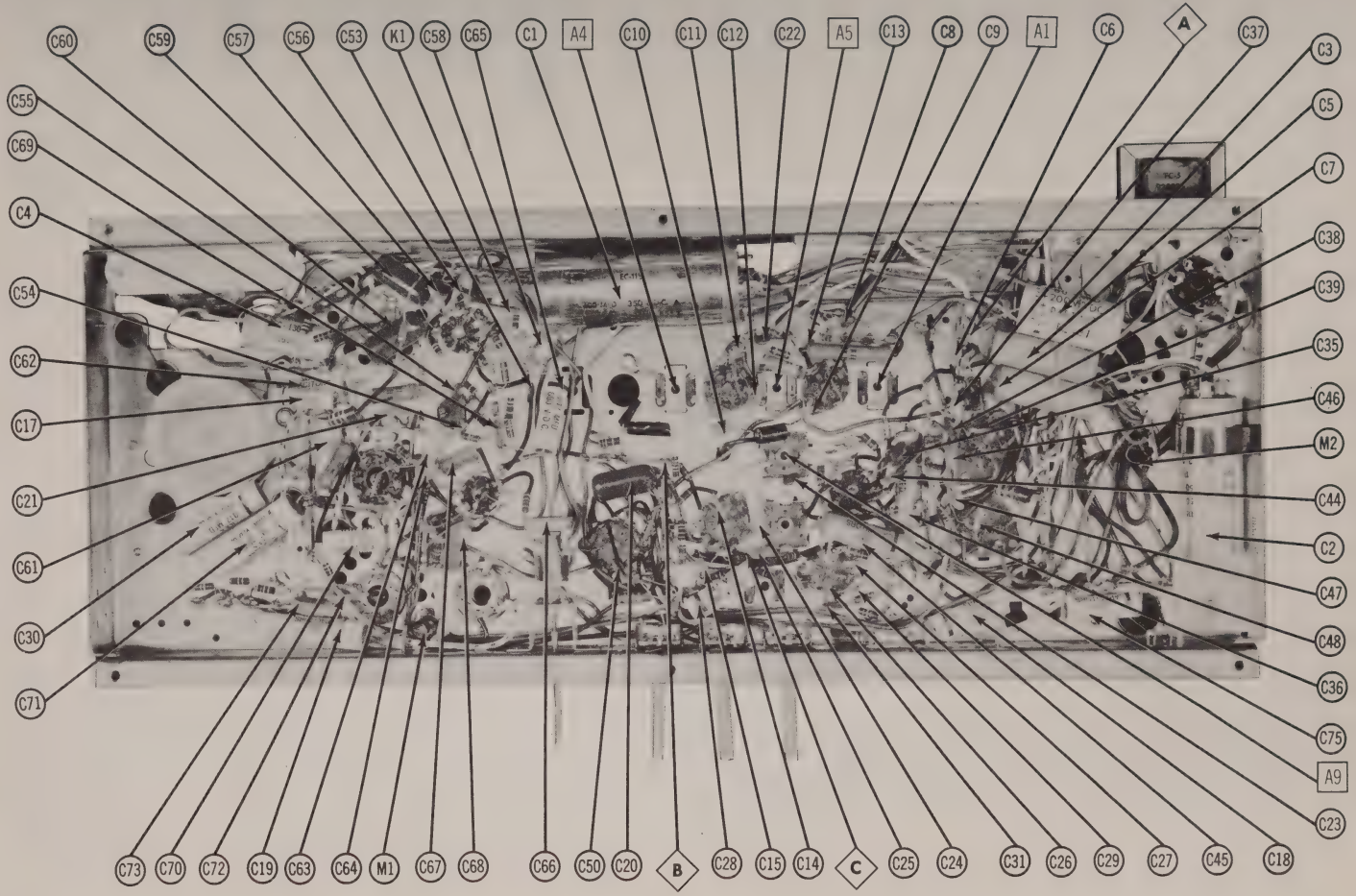
VHF TUNER—BOTTOM VIEW



VHF TUNER, CONTROL PANEL



TV CHASSIS - TOP VIEW



TV CHASSIS BOTTOM VIEW - ALIGN., CAPACITOR, MISC. IDENT.

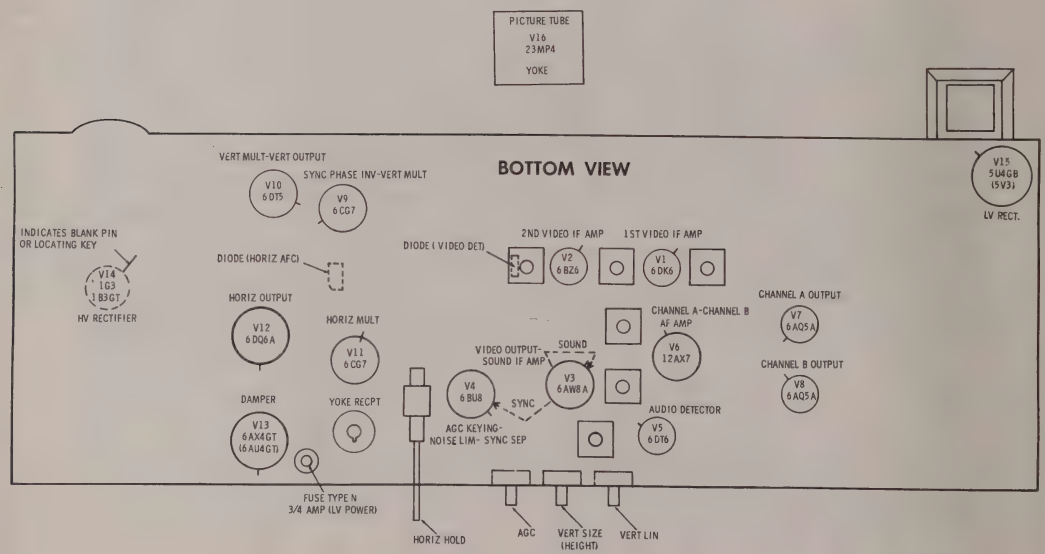
TV RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6DK6	150K	47Ω	FIL	FIL	†3800Ω	†3800Ω	0Ω		
V2	6BZ6	.1Ω	56Ω	FIL	FIL	†4000Ω	†4000Ω	0Ω		
V3	6AW8A	0Ω	100K	†100K	FIL	FIL	•10Ω	6900Ω	†3600Ω	†7500Ω
V4	6BU8	†2400Ω	†8200Ω	2meg	FIL	FIL	•40K	†390K	†47K	†4.7meg
V5	6DT6	20Ω	680Ω	FIL	FIL	†780K	†11K	560K		
V6	12AX7	†480K	2.2meg	270Ω	FIL	FIL	†480K	2.2meg	270Ω	FIL
V7	6AQ5A	470K	220Ω	FIL	FIL	†850Ω	†8700Ω	NC		
V8	6AQ5A	NC	220Ω	FIL	FIL	†850Ω	†8700Ω	470K		
V9	6CG7	•†1.5meg	220K	¶120K	FIL	FIL	†11K	1.6meg	2200Ω	0Ω
V10	6DT5	†150Ω	NC	2.2meg	FIL	FIL	NC	•400Ω	NC	†410Ω
V11	6CG7	†7600Ω	1.8meg	1500Ω	FIL	FIL	†100K	56K	1500Ω	0Ω
V12	6DQ6A	NC	FIL	NC	†12K	470K	TP	FIL	0Ω	TOP CAP †10Ω
V13	6AX4GT	NC	NC	620K	NC	†50Ω	NC	FIL	FIL	
V14	1G3/1B3GT		PINS	1 THRU 8	HAVE	INFINITE	RESISTANCE			TOP CAP †440Ω
V15	5U4GB	NC	¶30K	NC	24Ω	NC	23Ω	NC	¶30K	
V16	23MP4	FIL	39K	†150K	†150K	NC	NC	•100K	FIL	
V201	6GK5	0Ω	¶3meg	FIL	FIL	†3900Ω	0Ω	0Ω		
V202	6CG8A	4700Ω	†7400Ω	0Ω	FIL	FIL	†3700Ω	†2700Ω	0Ω	222K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

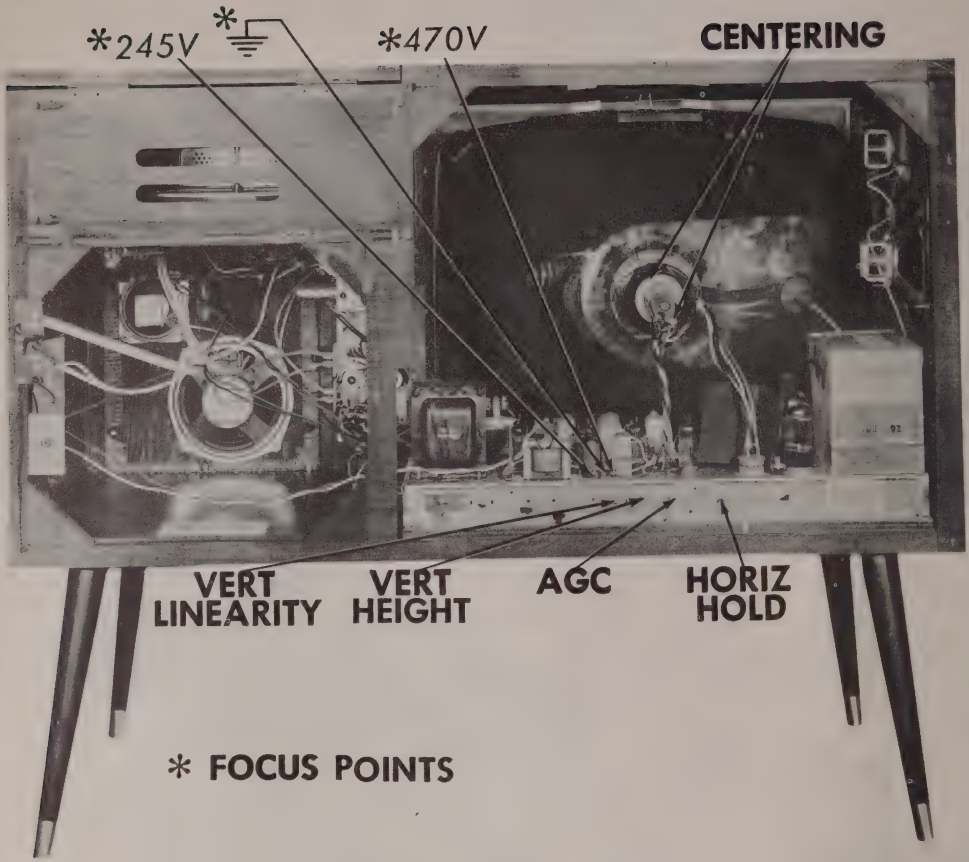
ALL MEASUREMENTS MADE WITH SELECTOR IN "TV" POSITION.

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM PIN 8 OF V15.
† MEASURED FROM PIN 3 OF V13.

NC NO CONNECTION
TP TIE POINT



TUBE PLACEMENT CHART



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Set the Brightness and Contrast for a normal picture.

Turn the Horizontal Hold clockwise until the picture loses sync. It may be necessary to switch off channel and back again for picture to lose sync.

Turn the Horizontal Hold slowly counterclockwise until the picture just falls into sync.

DISASSEMBLY INSTRUCTIONS

TV CHASSIS REMOVAL

1. Remove 10 push-on type knobs on front panel.
2. Remove 12 wood screws in rear cover. Remove rear cover.
3. Remove 6 chassis bolts.
4. Remove 4 nuts holding control panel. Note: It is necessary to remove panel at front of record changer for access to one of the nuts holding control panel. This may be done by removing 2 wood screws in panel.
5. Unsolder speaker leads, antenna leads, and remove plugs from control bracket.
6. Remove picture tube socket, yoke plug, power plug from FM-AM tuner, and hi voltage lead.
7. Remove chassis.

FM-AM TUNER REMOVAL

1. Remove panel cover over tuner (by removing 2 wood screws).
2. Remove 2 bolts at bottom edge of tuner mounting board.
3. Tuner must be removed by pulling up through top.

PICTURE TUBE REMOVAL

It is necessary to remove TV chassis for picture tube removal.

PHOTOFACT® Folder

PRODUCTION CHANGE BULLETIN

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 8 IN SET 528

MOTOROLA MODELS C20B, P, W (CH. HS-815)

Motorola Models C12B, C12P, C12W (Ch. HS-815) were covered in PHOTOFACT Folder 8 - Set 528.

Models C20B, C20P, C20W (Ch. HS-815) are electrically similar except for the following changes.

COMPONENT CHANGES

R4 is decreased from 100Ω to 56Ω.

A .005mfd capacitor is added between the junction of C4, R3 and C5.

C10 is decreased from .005mfd to .0022mfd.

C11 is decreased from 150mmf to 100mmf.

R8 is increased from 220K to 270K.

R9 is decreased from 1meg to 330K.

R10 is increased from 150K to 330K.

R12 is increased from 56Ω to 82Ω.

R13 is decreased from 180Ω to 68Ω.

C12 is increased from .0022mfd to .005mfd.

C13 is increased from .0022mfd to .005mfd.

C14 is decreased from .005mfd to .0022mfd.

(Continued On The Reverse Side)

PRODUCTION CHANGE BULLETIN

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 16 IN SET 536

WESTINGHOUSE MODELS H-732P7, GP, H-733P7, GP (CH. V-2403-1)

Westinghouse Models H-732P7, H-732P7GP, H-733P7, H-733P7GP (Ch. V-2403-1) were covered in PHOTOFACT Folder 16 - Set 536.

The following changes were made by the manufacturer during late production.

COMPONENT CHANGES

L1 (Loopstick Antenna) is changed to Part #310V070H01.

R11 is increased from 3300Ω to 4700Ω.

R12 is deleted.

R13 is deleted, the Emitter of X4 is connected to ground.

R21 is decreased from 10K to 8200Ω.

L3 (First IF Transformer) is changed to Part #235V066H04.

X4 (AF Amp.) is changed to a Type R680 (Part #297V004H13).

X5 (Driver) is changed to a Type R680 (Part #297V004H13).

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CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	36K647505	Tuning & Volume, Model C20B
Knob	36K647504	Tuning & Volume, Model C20P
Knob	36K647506	Tuning & Volume, Model C20W
Knob	38B60188A02	Pushbutton
Cabinet	1V60040A30	Front Assembly, Model C20B
Cabinet	1V60040A31	Front Assembly, Model C20P
Cabinet	1V60040A32	Front Assembly, Model C20W
Cabinet	24D60287A05	Back Assembly, Model C20B
Cabinet	24D60286A06	Back Assembly, Model C20P
Cabinet	24D60287A04	Back Assembly, Model C20W
Dial Scale	34D60137A01	
Dial Pointer	52B60163A05	
Clock Crystal	61C60136A02	
Clock Hand	52B60882A04	Alarm
Clock Hand	52B60882A02	Hour
Clock Hand	52B60882A01	Minute
Clock Hand	52B60882A03	Second
Dial	34C60883A01	Clock Face

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 1 IN SET 520

AIRLINE MODELS WG-4224B, WG-4324B

Airline Models WG-4224A, WG-4324A were covered in PHOTOFACT Folder 1 - Set 520.

Models WG-4224B, WG-4324B are electrically similar except for the following changes.

COMPONENT CHANGES

R24 is deleted.

R25 is deleted.

A 330K resistor is added between Pins 2 and 3 of V3 (8BQ5).

A 2.7meg resistor is added from Pin 2 of V3 (8BQ5) to Pin 5 of V11 (12DQ6B).

R27 is delected. Pin 3 goes to the high side of R1A (Contrast Control).

R46 is increased from 6800Ω to 10K.

T1 (Vertical Output Transformer) is changed to Part #51X223-2.

C39 is decreased from 18mmf to 7mmf.

R78 is increased from 1meg to 1.5meg.

R79 is decreased from 22K 2 watts to 20K 2 watts.

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 9 IN SET 536

RCA MODEL CRM-P3A-5

RCA Model CRM-P3A-5 was covered in PHOTOFACT Folder 9 - Set 536. The following changes were made by the manufactuter during late production.

COMPONENT CHANGES

R53 is increased from 1meg to 3.3meg.

C22 is decreased from 10000mmf to 1000mmf.

R16 is increased from 2200Ω to 22K 1 watt.

C56 is increased from .1mfd to .22mfd.

COMPONENTS ADDED

A 4.7meg resistor is added from Pin 2 of V6 (6AQ5A) to the junction of R24 and R25.

A external speaker terminal board is added from the high side of the speaker to ground.

CIRCUIT CHANGES

V5C (6T8A) is replaced with a diode detector (1N128). The negative side of the diode connects to the junction of R24 and R25. The cathode side of the diode connects to the junction of R26 and C30.

A 100mmf capacitor is added from the junction of R26 and C30 to ground.

PHOTOFACT® Folder with CIRCUITRACE®

CHEVROLET MODEL 988336
CORVAIR MODEL 988460
PONTIAC TEMPEST MODEL 989792

CHEVROLET MODEL 988336
CORVAIR MODEL 988460
PONTIAC TEMPEST MODEL 989792

CHEVROLET MODEL 988336
CORVAIR MODEL 988460
PONTIAC TEMPEST MODEL 989792

TRADE NAME	Chevrolet Truck Model 988336 (For 1961 Chevrolet Truck Series 95) Corvair Model 988460 (For 1961 Corvairs) Pontiac Tempest Model 989792 (For 1961 Pontiac Tempests)
MANUFACTURER	Delco Radio Div., General Motors Corp., Kokomo, Indiana
TYPE SET	Battery Operated 4 Tube - 1 Transistor Custom Built AM Receiver
POWER SUPPLY	12 Volt Storage Battery RATING 1.8 Amp. @12.6 Volts DC
TUNING RANGE	540 – 1600KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
A1, thru A5, A9, A10.....GENERAL CEMENT #8282, 8606, 8606-L, 9091
WALSCO #2526, 2541, 2542, 2543, 2544
A6, A7, A8.....GENERAL CEMENT #5004, 5009, 8195, 8274, 8275, 8607, 8728, 8987, 8988, 8989, 9291
WALSCO #2515, 2520, 2522, 2523, 2531, 2532, 2534, 2537, 2538

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of Converter. Low side to chassis.	262KC (400% Mod.)	High end stop.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
	Check setting of Oscillator core (A5). Rear of core should be 1 5/8" from mounting end of coil form.					
2.	High side thru 82mmf to pin 7 (grid) of Converter. Low side to chassis.	1615KC	"	"	A6, A7, A8	"
3.	"	600KC	600KC Signal.	"	A9, A10	"
4.	"	1615KC	High end stop.	"	A7, A8	"
5.	With radio installed in car and antenna fully extended, tune in a weak station and adjust A8 for maximum output.					

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KD969

SET 556 FOLDER 4

PARTS LIST AND DESCRIPTIONS

TUBES

◆ GENERAL ELECTRIC ◆			RAYTHEON ◆	SYLVANIA ◆	
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	RF Amplifier	12DZ6	V3	IF Amplifier	12EK6
V2	Converter	12AD6	V4	Det.-AVC-AF Amp.	12DS7

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA		NOTES
			RCA PART No.	RAYTHEON PART No.	
X1	DS503	Output	2N176		PNP Note 1

Note 1. When replacing, apply silicone grease between transistor and heat sink. Tighten mounting screws securely. Check bias adjustment.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	DELCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1A	■850	16	7273730	AFH3-54-30			WP300.6		TVLS-3201 *
B	▲400	16							
C	2.2	11.5AC							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2		#7275120						
C3	.047 75V		P288N-047	DD-503	CUB2S47	1DP-2-473	GEM-4147	2TM-S47
C4A	68 N750 10%		N750-DI 68	TCN-68	C10Q68U	CCTN-680	CN7-468	10TCU-Q68
B	43		N750-DI 39	TCN-43	C10Q43U	CCTN-390	CN7-339	10TCU-Q39
C5		#7273697						
C6	.1 75V		P288N-1	DF-104	CUB2P1	1DP-2-104	GEM-201	2TM-P10
C7	33 10%		DI-330	DD-330	L10Q33	CCD-330	GP433	10TS-Q33
C8	.0047		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C9	560		DI-560	DD-561	L10T56	CCD-561	B-356	10TS-T56
C10A	220		DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22
B	220		DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22
C11	.47 100V		P288N-47		CUB2P47	1DP-4-474	GEM-2047	2TM-P47

Delco Part Number.

CONTROLS

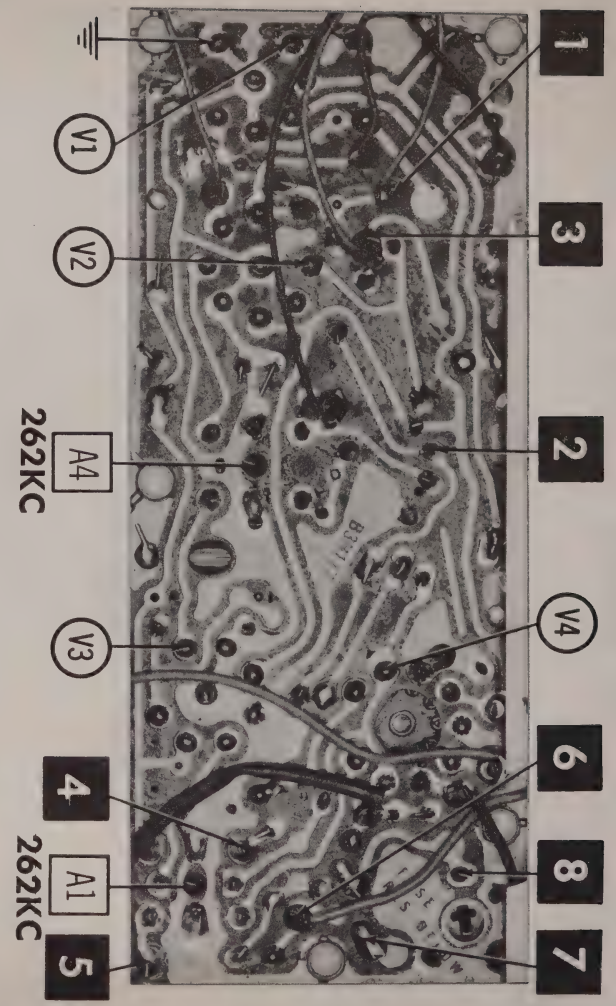
ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	DELCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	5meg	½	7278058 ①				■ UE4249-S	Tone
B	5meg	½						Volume
C	Switch							Power Off-On
R2	300Ω 135ΩStop	2(WW)	7275474 *					Bias

① Model 989792 uses Part #7277112.
Model 988336 uses Part #7277288 (Tapped volume)
■ "STA-LOC" equivalent: FR56L, RU56A, OS1250A, IS1812, US41.
* Temperature Compensated.

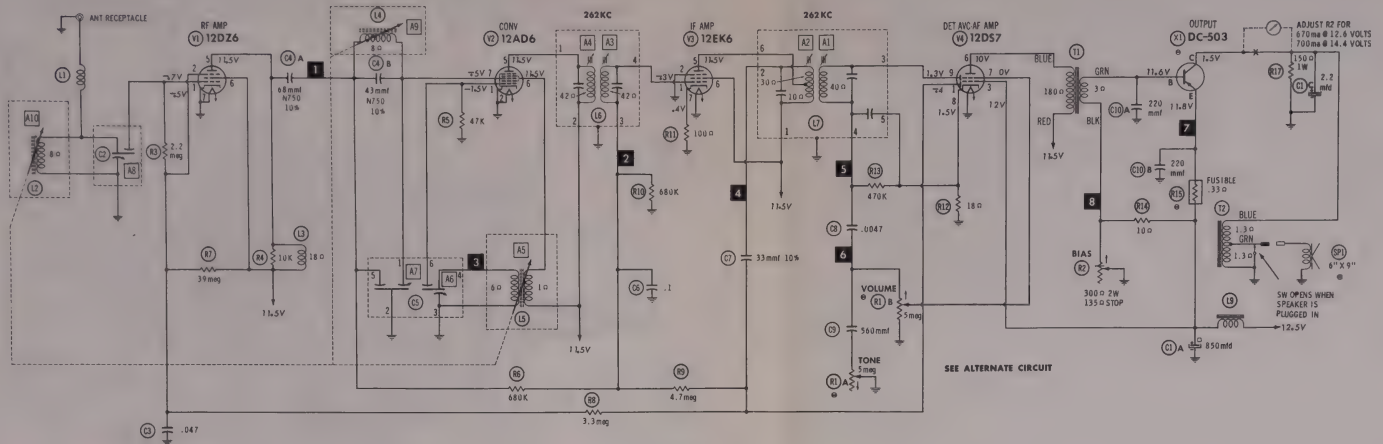
(CONTINUED ON REAR PAGE)

A Howard W. Sams CIRCUITRACE® Photo

PRINTED BOARD



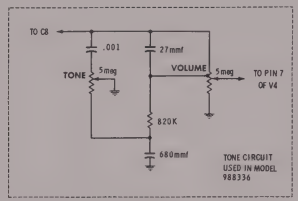
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12DZ6	9 meg	7 meg	FIL	FIL	70 Ω	60 Ω	0 Ω		
V2	12AD6	47K	0 Ω	FIL	FIL	100 Ω	60 Ω	1.3 meg		
V3	12EK6	680K	0 Ω	FIL	FIL	85 Ω	60 Ω	100 Ω		
V4	12DS7	5 meg	TP	4 Ω	FIL	FIL	240 Ω	0 Ω	18 Ω	470K

TRANSISTOR CIRCUIT RESISTANCE FOR X1 NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.



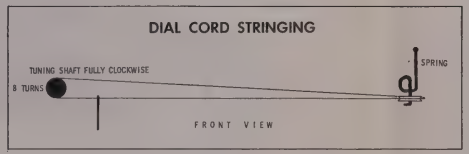
1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

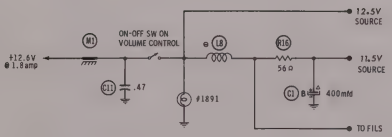
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)





A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE
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CHEVROLET MODEL 988336
CORVAIR MODEL 988460
PONTIAC TEMPEST MODEL 989792

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS
R3	2.2meg			
R4	10K			
R5	47K			
R6	680K			
R7	39meg			
R8	3.3meg			
R9	4.7meg			
R10	680K			
R11	100Ω			
R12	18Ω			
R13	470K			
R14	10Ω			
R15	.33Ω			Note 1
R16	56Ω			
R17	150Ω 1W			

Note 1. Fuse type. Part #7274151 used in Models 988460 and 989792.
Part #7274329 used in Model 988336.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		DELCO PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	RF Choke(6.5uh)	7255738	BC-565	4610	RTC-8520	T859	① Part #7241708 used in Model 988792
L2	Ant.	1221138					
L3	RF Choke(1.8MH)	7269684	BC-514	4664	RTC-8533	T875	
L4	RF	1221138					
L5	Osc.	1221263					
L6	Input IF	1221257	BC-344	12-PH1	RTC-8644	T655	
L7	Output IF	1221255	BC-424				
L8	Hash Choke(1.4uh)	1217846①					

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ∿)	DELCO PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
L9	.700A	.7Ω	.011 HY	7274342		TC-2			

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	DELCO PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	6.8	1	1221590		TA-48			

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE	REPLACEMENT DATA					NOTES
	PRI.	DELCO PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	8Ω Tap @ 3-4Ω	1221535		TA-50			

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	DELCO PART No.	QUAM PART No.	
SP1	6"x 9"	PM	3-4Ω	7275558	69A2	Model 988460
	4"x 10"	PM	3-4Ω	7276547		Model 989792
	6"x 9"	PM	3-4Ω	7277515		Model 988336

MISCELLANEOUS

ITEM No.	PART NAME	DELCO PART No.	NOTES
M1	Spark Plate	1221509	Model 988460, 988336
	Spark Plate	7271564	Model 989792

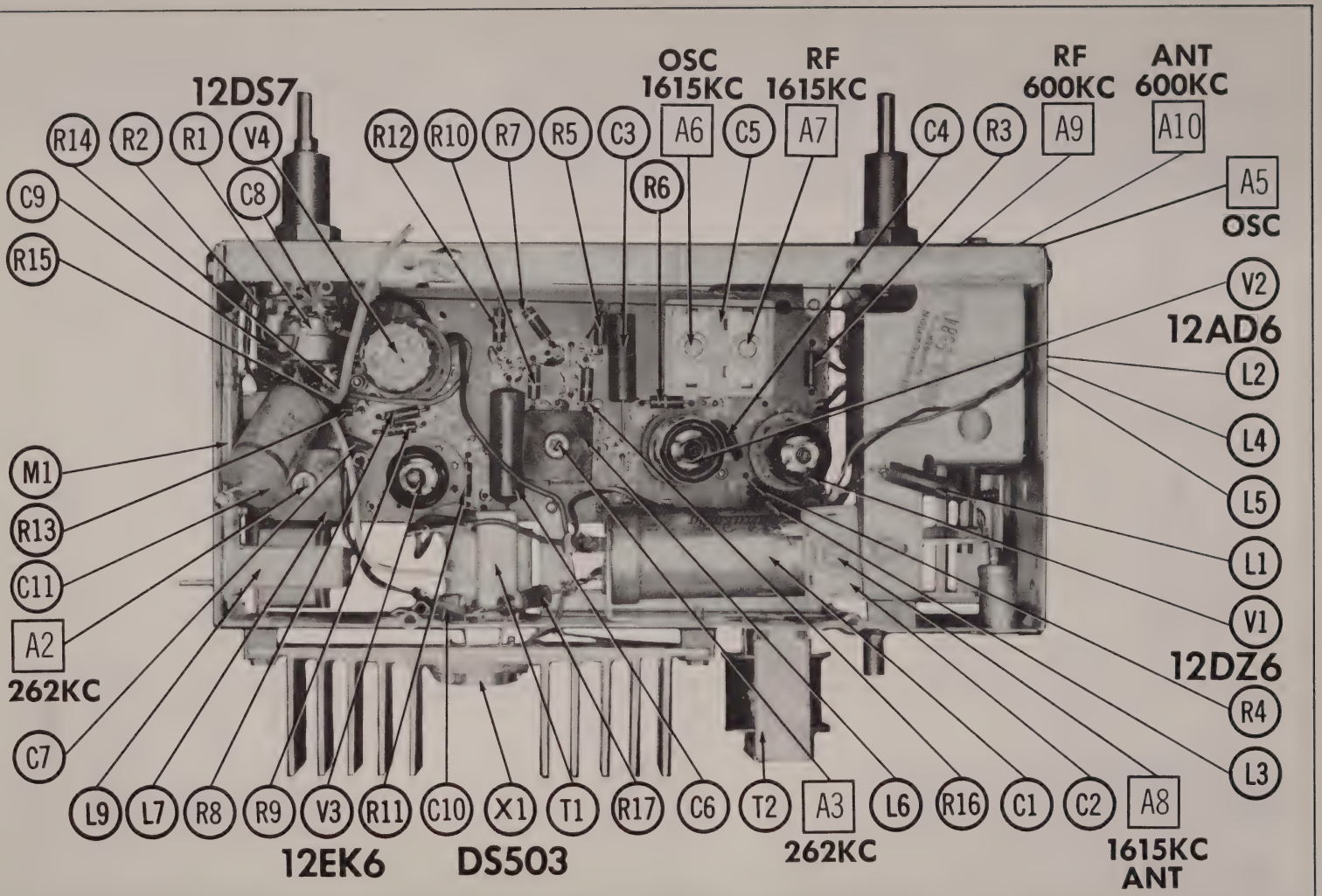
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Dial Pointer	7270446	Models 988336, 988460
Dial Pointer	7272125	Model 989792
Knob	7277055	Tuning, Volume, Models 988336, 988460
Knob	535908	Tuning, Volume, Model 989792
Knob	7272970	Tone, Models 988336, 988460
Knob	539611	Tone, Model 989792
Knob	7274782	Dummy, Models 988336, 988460
Knob	539610	Dummy, Model 989792

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire ..... Use BELDEN No. 8885
Bonding Strap ..... Use BELDEN No. 8661



CHASSIS TOP VIEW

PHOTOFACT® Folder

CORONADO
MODEL PH20-4034A

CORONADO
MODEL PH20-4034A

CORONADO
MODEL PH20-4034A

TRADE NAME	Coronado Model PH20-4034A
SUPPLIER	Gamble-Skogmo, Inc., 15 N. Eighth Street, Minneapolis 3, Minn.
TYPE SET	AC Operated 6 Tube AM Receiver With Stereo Amplifier And 4 Speed Automatic Record Changer
POWER SUPPLY	110 — 120 Volts AC, 60 Cycles RATING 27 Watts, .3 Amp. @ 117 Volts AC (Less Motor)
TUNING RANGE—BROADCAST	535 — 1620KC

FOR SERVICE INFORMATION ON RECORD CHANGER — SEE SIMILAR V-M 1201 — PHOTOFACT SET 436 FOLDER 18 OR RECORD CHANGER MANUAL RC-12

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1 thru A4... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A5, A6..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	1620KC	"	"	A5	"
3.	"	1400KC	1400KC Signal.	"	A6	Adjust for maximum output.

SET 556 FOLDER 5

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

TUBES

◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	Converter	12BE6
V2	IF Amplifier	12BA6
V3	Det.-Channel 2 AF Amp.	12AV6
V4	Channel 1 AF Amp.	12AV6
V5	Channel 1 Output	35C5
V6	Channel 2 Output	35C5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA CORONADO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1A	60	150	30-6010	PR5-500	BBRQ0805	QT4-2	WQ290		TVA-4618
B	40	150							
C	20	150							
D	50	15							TVANS-1206.1*
C2A	40	15NP	60-6002	PRS7330	BR4015	NPQT-5			TVANS-1206.1*
B	40	15NP		PRS7330	BR4015	NPQT-5			

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

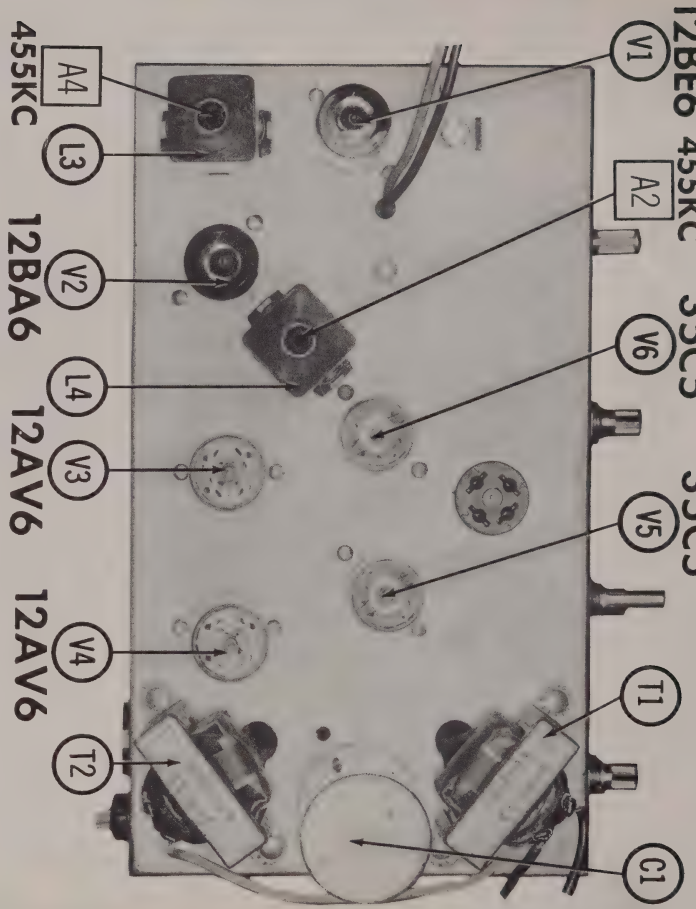
ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	.005	Note 1	BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C4	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-415	4TM-S47
C5	270		DI-270	DD-271	L10T27	CCD-271	B-327	10TS-T27
C6	.005		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C7	100 N150					*		10TCP-T10
C8	.005		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C9	.005		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C10	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C11	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C12	.005		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C13	.005		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C14	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C15	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C16	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C17	.1 400V		P488N-1	DF-104	CUB4P1	4DP-1-104	GEM-401	4TM-P10
C18	.05 400V	Note 1	P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50

Note 1. Not used in some versions.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA CORONADO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg		V6024	B-76	AD47-2meg-Z		FA26A	Volume, Channel 1
B	2meg			SR-76	Not Req.		RU26A	Volume, Channel 2
C	Shaft			Not Req.	KSS-3		CS3500	
R2A	Switch		SW6030					Radio-Phono
B	2meg							Tone, Channel 2
C	2meg							Tone, Channel 1
R3A	1meg		B6023R	B-69	A47-1meg-S	Q11-137	U54	Balance
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			KR-1	SWE-12	76-1	US-26	Power Off-On

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R4	22K			Note 1	R11	220K			
R5	1meg				R12	220K			
R6	2.2meg				R13	6.8meg			
R7	150Ω				R14	150Ω			
R8	47K				R15	2200Ω 1W			
R9	1meg				R16	150Ω 1W			
R10	6.8meg				R17	22Ω 3W	PW3-22	3W-SQ-22	

Note 1. Not used in some versions.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		CORONADO PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	Loopstick	R1630	BC-419	705-A		T532	
L2	Osc.	01631	BC-393	69-OSC	RTC-8646	T503	
L3	Input IF	E09987	BC-352	14-C1	RTC-8632	T607	
L4	Output IF	E09987	BC-353	14-C2	RTC-8633	T608	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	CORONADO PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	3800Ω	3-4Ω	T06033	A-3025	A-3332	24S48	S-41Z	
T2	3800Ω	3-4Ω	T06033	A-3025	A-3332	24S48	S-41Z	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	CORONADO PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	U-V4AZ16	4A05	
SP2	6"	PM	6-8Ω	GCM57	6A15Z8	
SP3	4"	PM	3-4Ω	U-V4AZ16	4A05	

POWER RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA			NOTES
	CURRENT (Measured)	CORONADO PART No.	RCA PART No.	SARKES TARZIAN PART No.	
M1	.080A	2E4	1N1763	2F4	

PHONO CARTRIDGE & NEEDLES

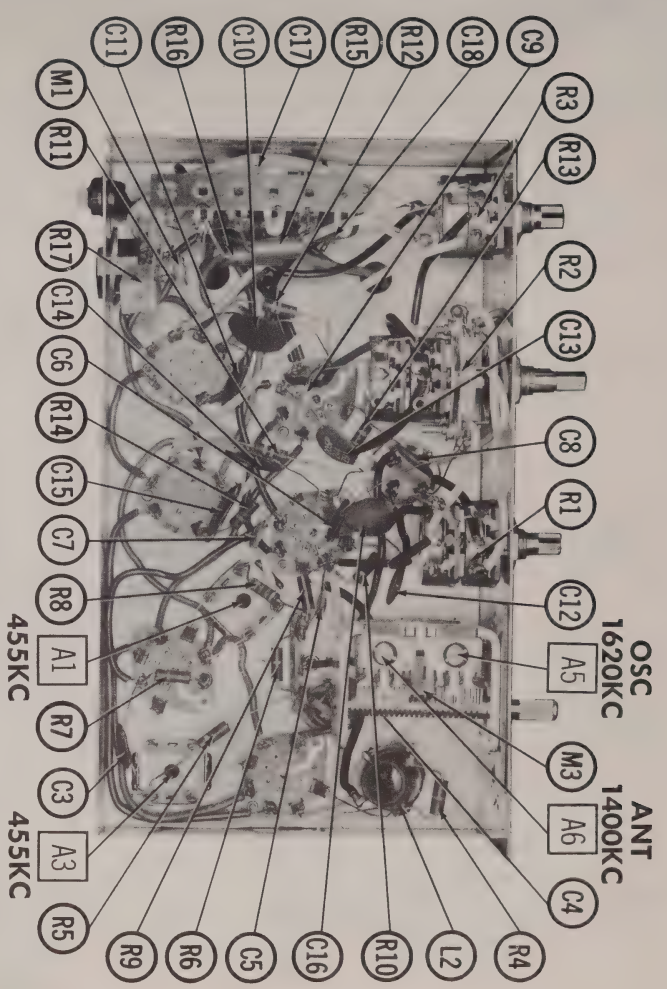
*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

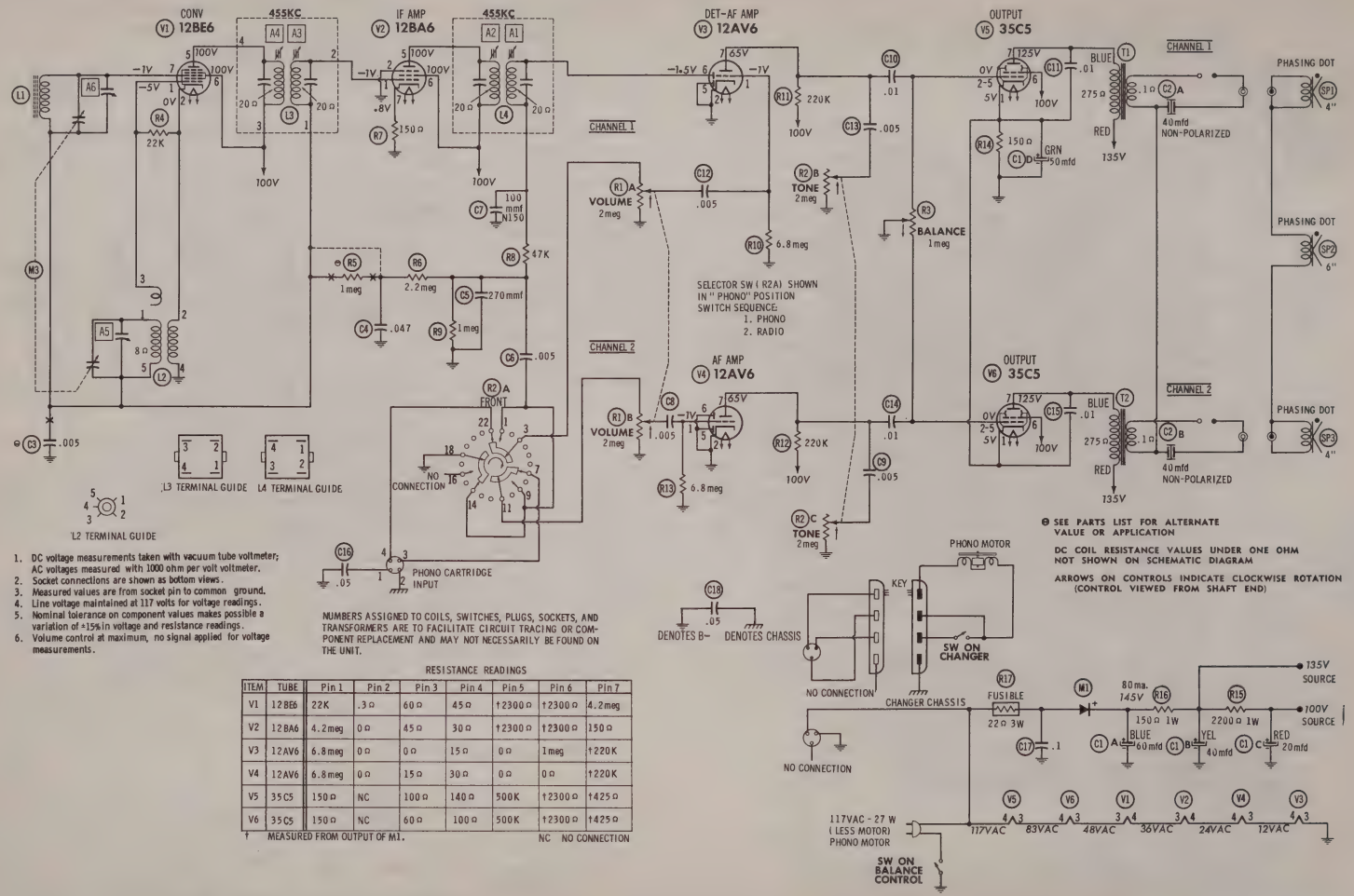
ITEM No.	REPLACEMENT DATA								NOTES
	CORONADO PART No.		ASTATIC PART No.		ELECTRO-VOICE PART No.		SONOTONE PART No.		
	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	
M2	ST-20	STV-075 (LP)	80TS	N8-7 *	96T	Not Req.	12THA-S	N-12THAS*	
		STV-250 (78RPM)		N8-3*					

MISCELLANEOUS

ITEM No.	PART NAME	CORONADO PART No.	NOTES
M3	Tuning Cap.	VC6143	2 Gang

CHASSIS—BOTTOM VIEW





1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.3Ω	60Ω	45Ω	†2300Ω	†2300Ω	4.2meg
V2	12BA6	4.2meg	0Ω	45Ω	30Ω	†2300Ω	†2300Ω	150Ω
V3	12AV6	6.8meg	0Ω	0Ω	15Ω	0Ω	1meg	†220K
V4	12AV6	6.8meg	0Ω	15Ω	30Ω	0Ω	0Ω	†220K
V5	35C5	150Ω	NC	100Ω	140Ω	500K	†2300Ω	†425Ω
V6	35C5	150Ω	NC	60Ω	100Ω	500K	†2300Ω	†425Ω

† MEASURED FROM OUTPUT OF M1. NC NO CONNECTION

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CORONADO
MODEL PH20-4034A

PHOTOFACT® Folder

FANON
MODEL 3045

FANON
MODEL 3045

FANON
MODEL 3045

TRADE NAME	Fanon Model 3045
MANUFACTURER	Fanon Electronic Sales Corp., A Div. of Fanon Electronic Industries, Inc., 439 Frelinghuysen Ave., Newark 12, N. J.
TYPE SET	AC Operated 4 Tube Audio Amplifier
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 110 Watts, 1 Amp. @ 117 Volts AC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of KX818

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PARTS LIST AND DESCRIPTIONS

TUBES

◆ GENERAL ELECTRIC ◆		◆ RAYTHEON ◆ SYLVANIA ◆		
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	AF Amplifier-Phase Inverter	7199	V3	Output	6L6GC
V2	Output	6L6GC	V4	Rectifier	GZ34/5AR4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA FANON PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1	40	350	170-15	PRS1670	BR4035	QT1-14	TC78	TD-40-350	TVA-1611
C2A	▲40	350	173-09	AFH3-53	C0400	XC3-15	FP399.5	TMT-3865	TVL-3962
B	▲10	500							
C	■10	400							
C3A	5	100	172-06	PRS1400	NLW5-150	MT1-4	TT150X5	MLV5-150	TE-1504
B	5	100		PRS1400	NLW5-150	MT1-4	TT150X5	MLV5-150	TE-1504
C4	50	10	Note 1	PTT45	NLW50-10	MT1-16	TT10X50	MLV50-10	TE-1119

Note 1. Some versions may use 40mfd@6 volts in this application.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	.01		BPL-01	DD-103	BYA1031	CCD-103	B-110	5HK-S10
C6	.1 200V		P288N-1	DF-104	CUB22P1	2DP-3-104	GEM-201	2TM-P10
C7	.02		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C8	.033 400V		P488N-033	DD-303	CUB6S33	4DP-2-333	GEM-4133	4TM-S33
C9	.033 400V		P488N-033	DD-303	CUB6S33	4DP-2-333	GEM-4133	4TM-S33

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA FANON PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	203-70	B-70	A47-1meg-Z	Q13-137	U53	Volume
B	Shaft			Not Req.	KS8-3	Not Req.	Not Req.	
R2A	150K	½	203-40	TT-46	B47-150K-S	BU-328	TA-184L	Bias Adjust
B	Shaft			Not Req.	Not Req.	TM4	Not Req.	
R3A	100Ω	2(WW)	209-03	WN-101	A43-100	W11-084	R100L	Hum Balance
B	Shaft			Not Req.	FKS-1/4	SK5	Not Req.	

RESISTORS

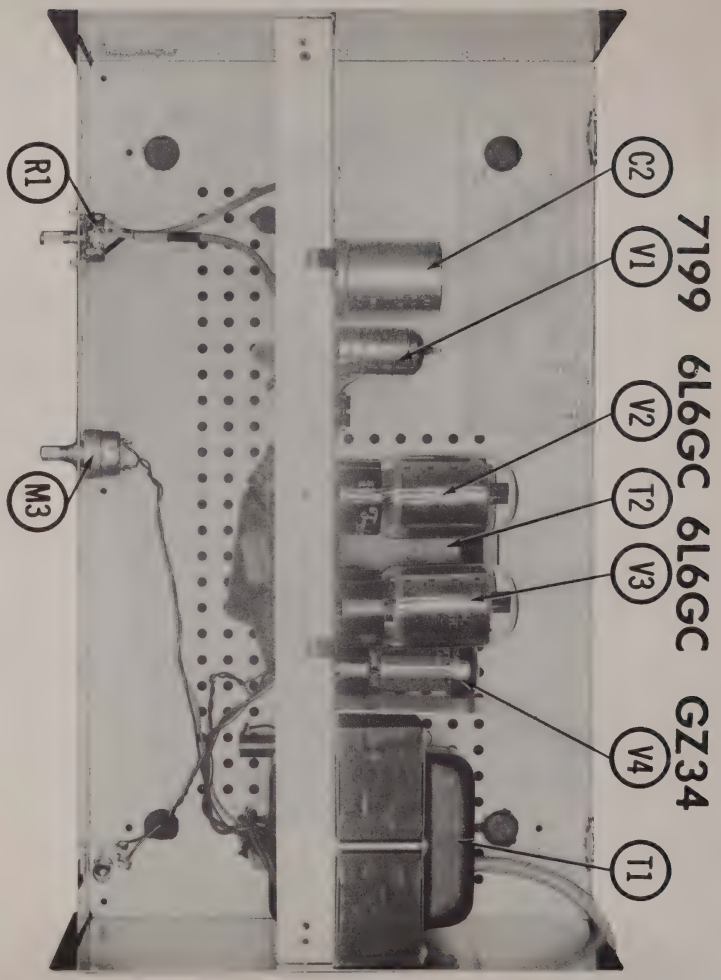
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R4	220K			
R5	820K			
R6	820Ω			
R7	68Ω			
R8	1meg			
R9	100K			
R10	1500Ω			
R11	100K			
R12	10K			
R13	75K			
R14	15K 2W			
R15	18K 2W			

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R16	75K			
R17	33K 2W			
R18	33K 2W			
R19	33K 2W			
R20	33K 2W			
R21	150K			
R22	220K			
R23	100K			
R24	220K 1W			(150K) * Note 1
R25	680K			
R26	2200Ω 5W	PW5-2200	5W-SQ-2200	

* Alternate Value.
Note 1. Not used in some versions.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA: FANON PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
	PRI.	SEC. 1	SEC. 2						
T1	117V@ 1A	800VCT @ .125A DC	5V @ 1.9A	251-07					
	SEC. 3	SEC. 4	SEC. 5						
	6.3V@ 3A	6.3V							

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA: FANON PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
	PRI.	SEC.						
T2	6500Ω CT	110Ω (70V) Tap@ 16Ω, 8Ω, 4Ω	252-15					

POWER RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA: FANON PART No.	RCA PART No.	SARKES TARZIAN PART No.	NOTES
M1	.001A	291-03	1N1763	F4	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: FANON PART No. FUSE	FANON PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M2	3AG	3A 125V S/B			313003 (3AG 3A 125V) S/B	342001	MDX 3	HKP

MISCELLANEOUS

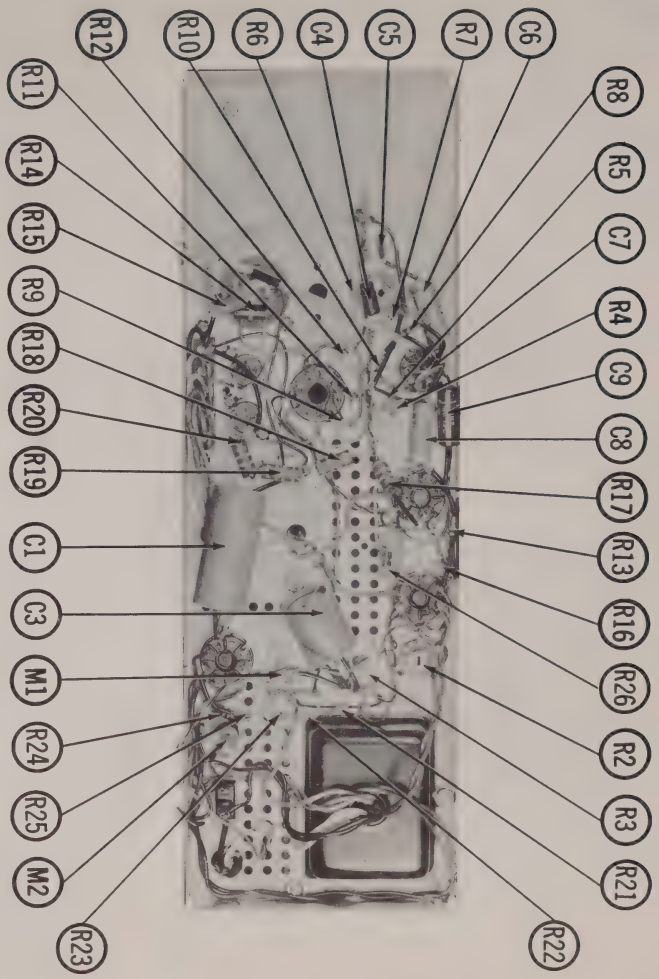
ITEM No.	PART NAME	FANON PART No.	NOTES
M3	Switch		Power Off-On

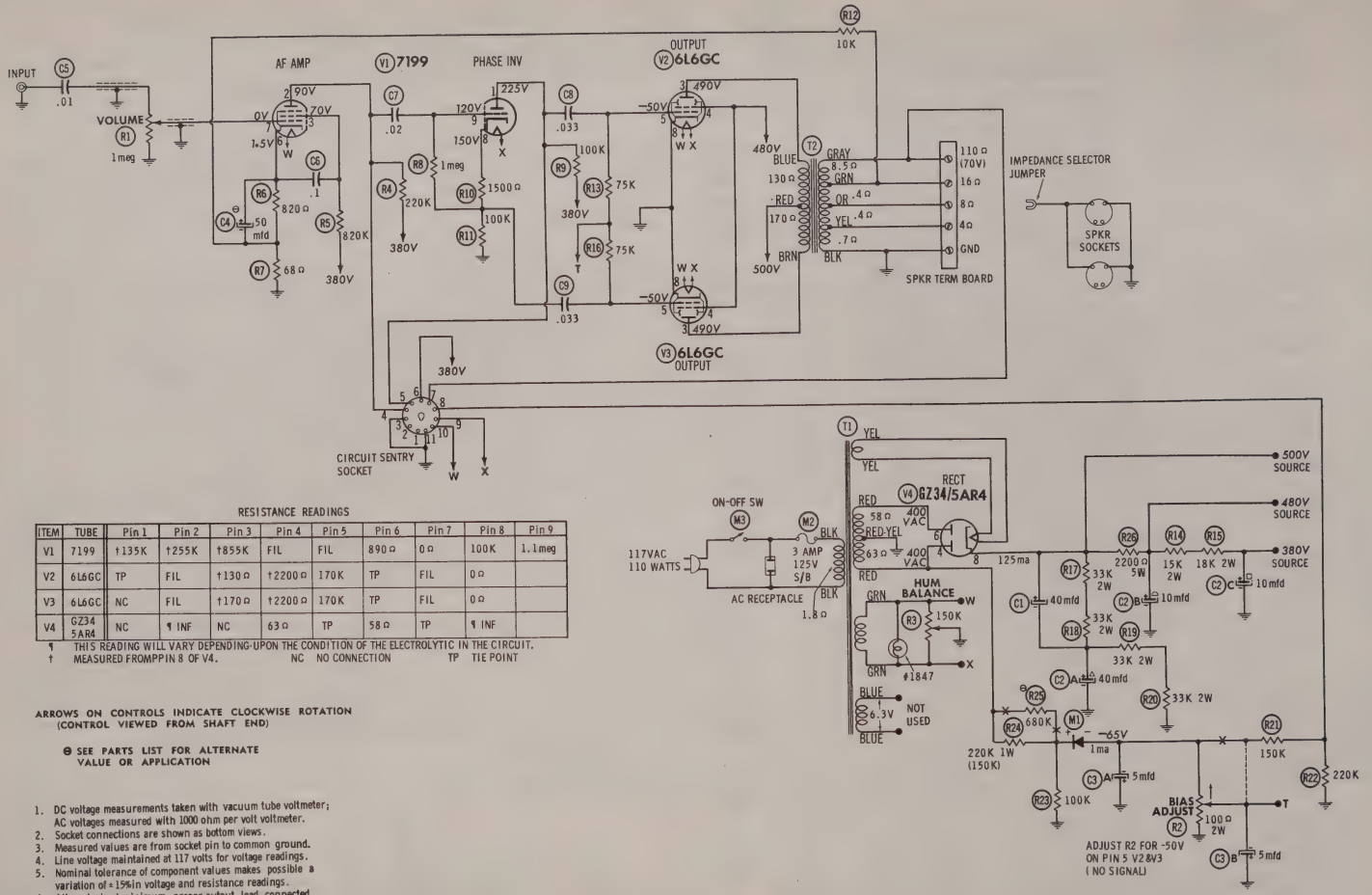
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

CHASSIS—BOTTOM VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	7199	†135K	†255K	†855K	FIL	FIL	890Ω	0Ω	100K	1.1meg
V2	6L6GC	TP	FIL	†130Ω	†2200Ω	170K	TP	FIL	0Ω	
V3	6L6GC	NC	FIL	†170Ω	†2200Ω	170K	TP	FIL	0Ω	
V4	GZ34 5AR4	NC	¶ INF	NC	63Ω	TP	58Ω	TP	¶ INF	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V4. NC NO CONNECTION TP TIE POINT

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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FANON MODEL 3045

PHOTOFACT® Folder

**FISHER
MODEL 100-R**

FISHER
MODEL 100-R

FISHER
MODEL 100-R

TRADE NAME	Fisher Model 100-R (Serial #10001 Thru 19999)
MANUFACTURER	Fisher Radio Corp., 21-21 44th Drive, Long Island City 1, N. Y.
TYPE SET	AC Operated 10 Tube FM-AM Tuner
POWER SUPPLY	105 - 120 Volts AC, 50-60 Cycles RATING 47 Watts, .42 Amp. @117 Volts AC
TUNING RANGE—BROADCAST	540 — 1600KC FREQ. MOD. 88 — 108MC

SET 556 FOLDER 7

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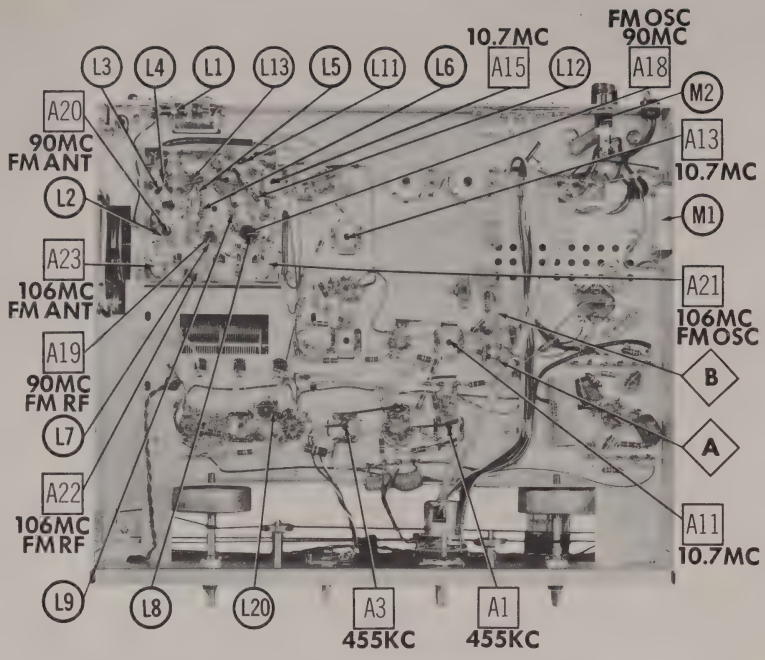
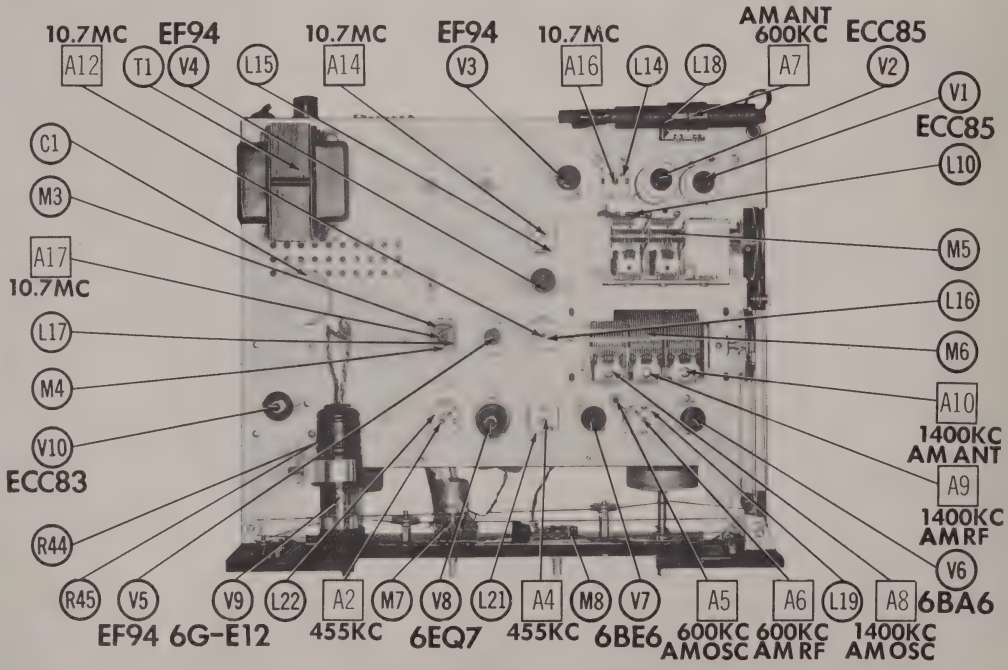
KL822



CHASSIS BOTTOM VIEW-ALIGN., INDUCTOR & MISC. IDENT.



CHASSIS-TOP VIEW

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use only enough generator output to provide a usable indication.

Suggested Alignment Tools:

A1 thru A4, A6, A13 thru A16...	GENERAL CEMENT #5097, 8727 WALSCO #2515
A5, A11, A12, A17 thru A20.....	GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440 WALSCO #2526, 2543, 2544, 2545
A8, A9, A10.....	GENERAL CEMENT #5004, 5008, 5009 WALSCO #2520
A21, A22, A23.....	GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089 WALSCO #2512, 2525, 2528

AM ALIGNMENT — SELECTOR IN AM POSITION

Bandwidth on Sharp.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of AM Converter. Low side to chassis.	455KC (400% 30% AM)	(AM) Point of non-interference.	AC probe across channel A output jack.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	High side thru 220mmf to antenna terminal #4. Disconnect link between terminals 4 and 5. Low side to chassis.	600KC	600KC	"	A5, A6, A7	Adjust for maximum deflection. A7 is adjusted by moving adjustable turns on loopstick.
3.	"	1400KC	1400KC	"	A8, A9, A10	Adjust for maximum deflection. Repeat Steps 2 and 3.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM—SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	High side to ungrounded tube shield over FM Mixer-Osc. Low side to chassis.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe to point Ⓐ. Common to chassis.	A11, A12, A13, A14, A15, A16	Adjust for maximum deflection.
5.	"	"	"	DC probe to point Ⓑ. Common to chassis.	A17	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE—SELECTOR IN FM POSITION

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

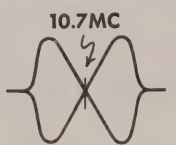
	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	High side to ungrounded tube shield over FM Mixer-Osc. Low side to chassis.	10.7MC (450KC Swp)	(FM) Point of non-interference.	Vert. amp. to point Ⓐ. Low side to chassis.	A11, A12, A13, A14, A15, A16	Disconnect stabilizing capacitor C3. Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Reconnect C3.
5.	"	"	"	Vert. amp. to point Ⓑ. Low side to chassis.	A17	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A11 for maximum amplitude and straightness of crossover lines.

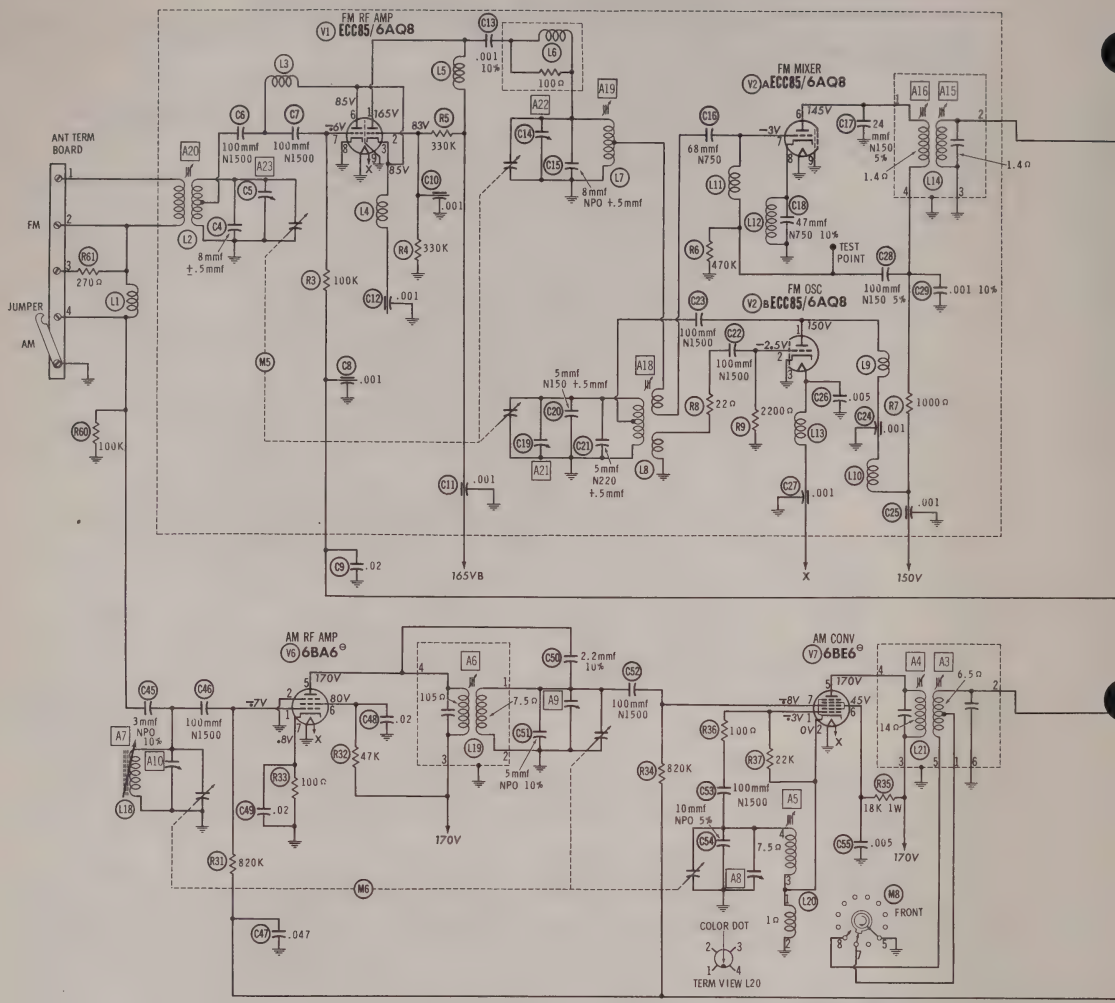
FM RF ALIGNMENT — SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	Across antenna terminals 4 and 5 with 120Ω in each lead.	90MC (Unmod.)	(FM) 90MC	DC probe to point Ⓐ. Common to chassis.	A18, A19, A20	Adjust for maximum deflection.
7.	"	106MC	106MC	"	A21, A22, A23	Adjust for maximum deflection. Repeat Steps 6 and 7.

FIG. 1

FIG. 2





BANDWIDTH SW (M8) SHOWN IN "SHARP" POSITION
SW SEQUENCE
1. SHARP
2. BROAD

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC85 6AQ8	†1000Ω	160K	INF	FIL	FIL	■0Ω	1meg	0Ω	0Ω
V2	ECC85 6AQ8	†2000Ω	2200Ω	0Ω	FIL	FIL	†3000Ω	470K	.1Ω	0Ω
V3	EF94 6AU6	1.4Ω	0Ω	FIL	FIL	†1400Ω	†48K	150Ω		
V4	EF94 6AU6	.1Ω	0Ω	FIL	FIL	†1400Ω	†48K	150Ω		
V5	EF94 6AU6	47K	0Ω	FIL	FIL	†1400Ω	†30K	0Ω		
V6	6BA6	3.1meg	0Ω	FIL	FIL	†440Ω	†47K	100Ω		
V7	6BE6	22K	.3Ω	FIL	FIL	†440Ω	†18K	3.1meg		
V8	6EQ7	0Ω	10Ω	180Ω	FIL	FIL	†27K	†1400Ω	160K	0Ω
V9	6G-E12	30K	†1meg	0Ω	2.3meg	†1meg	†220Ω	FIL	FIL	
V10	ECC83 12AX7	†100K	22meg	0Ω	FIL	FIL	†100K	22meg	0Ω	FIL

ALL MEASUREMENTS MADE IN FM-AM POSITION.
† MEASURED FROM OUTPUT OF M1.
■ MEASURED FROM PIN 3 OF V1.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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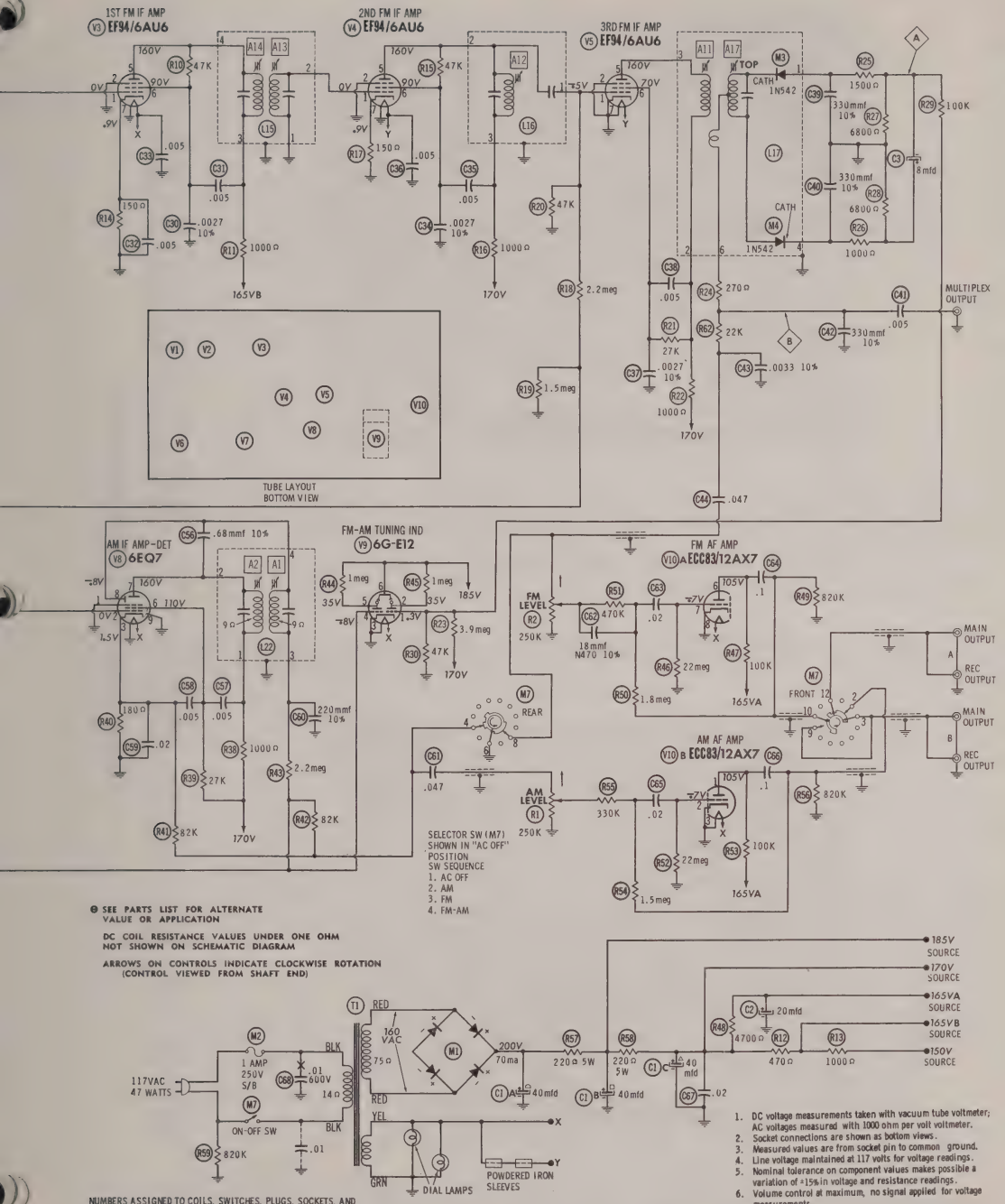


● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

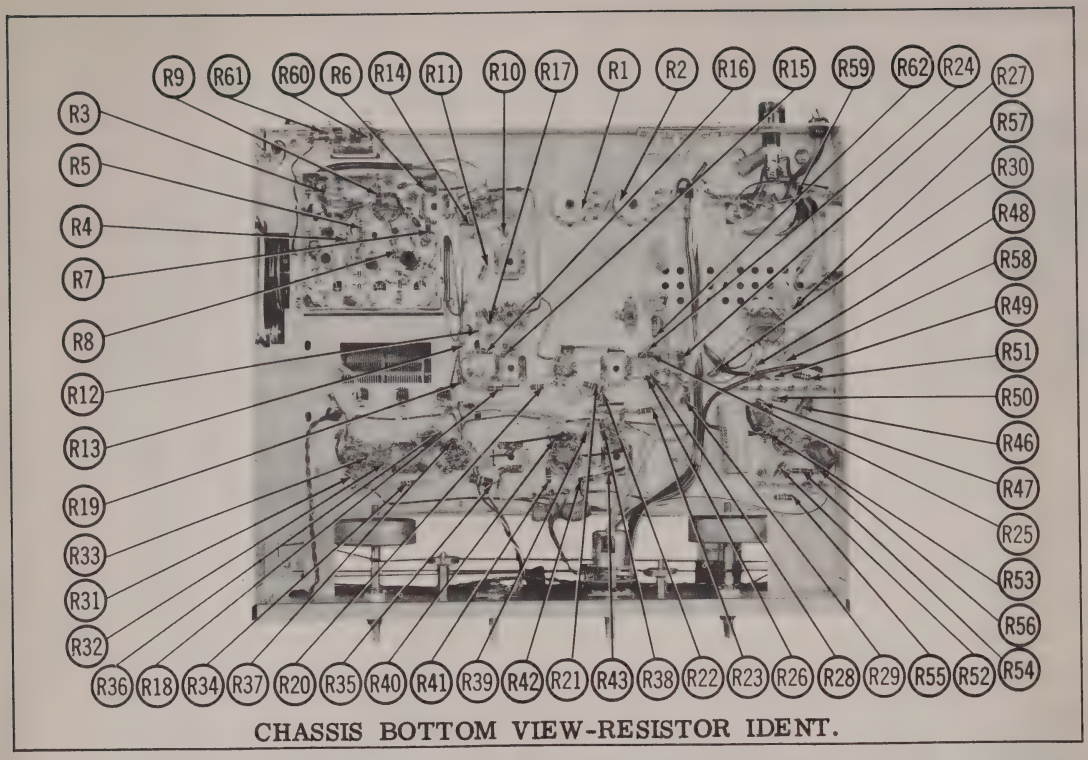
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

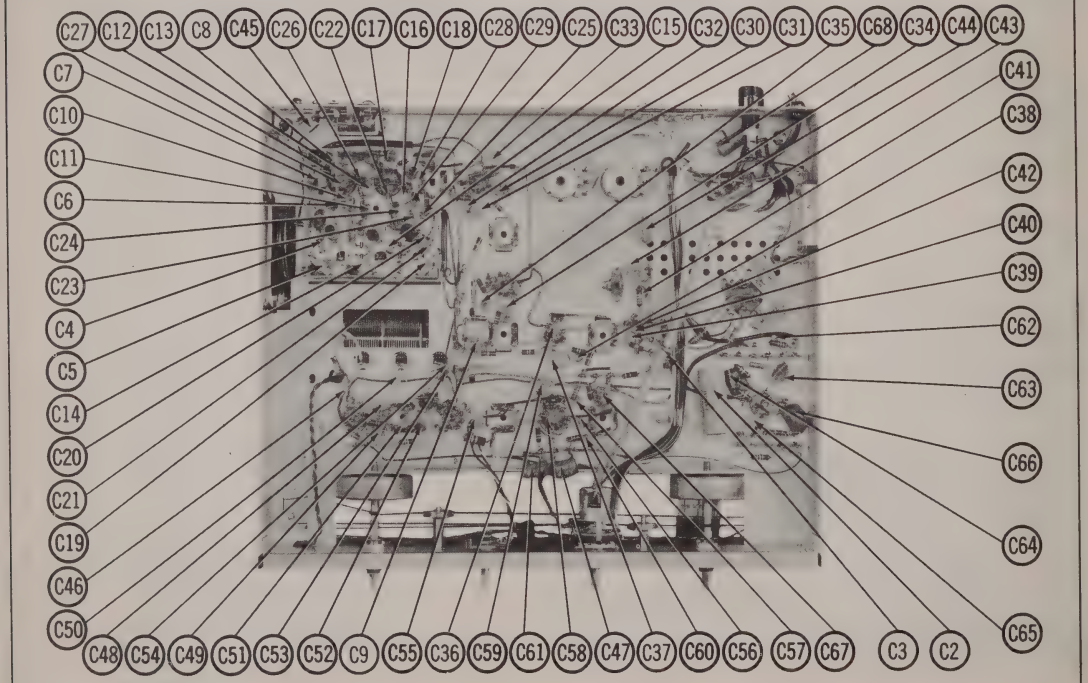
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

FISHER MODEL 100-R



CHASSIS BOTTOM VIEW-RESISTOR IDENT.



CHASSIS BOTTOM VIEW-CAPACITOR IDENT.

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	FM RF Amp.	ECC85/6AQ8	V6	AM RF Amp.	6BA6 (EF93) *
V2	FM Mixer - FM Osc.	ECC85/6AQ8	V7	AM Converter	6BE6 (EK90) *
V3	1st FM IF Amp.	EF94/6AU6	V8	AM IF Amp. - AM Det.	6EQ7
V4	2nd FM IF Amp.	EF94/6AU6	V9	FM-AM Tuning Indicator	6G-E12
V5	3rd FM IF Amp.	EF94/6AU6	V10	FM AF Amp.- AM AF Amp.	ECC83/12AX7

GENERAL ELECTRIC • RAYTHEON • SYLVANIA •

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	FISHER PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1A	▲40	300	C670-125	AFH4-02			FP327, 89	TMD-2315	TVL-3583
B	■40	250						TD-40-350	
C	▲40	250							
C2	20	250	C746-145	PRS1570	BR2025	QT1-9	TC55	TD-20-250	TVA-1508
C3	8	50	C629-138	PTT91	NLW8-50	MT1-6	TC41	MLV10-50	TE-1303.3

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	8 NPO ±.5mmf		NPO-SI 8.2		C10V82C			10TCC-V82
C5		#C662-123						
C6	100 N1500	#C50070-6		TCL-100		*		
C7	100 N1500	#C50070-6		TCL-100		*		
C8	.001		EF-001	MFT-1000		CCF-102	CT280A	
C9	.02		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C10	.001		EF-001	MFT-1000		CCF-102	CT280A	
C11	.001		EF-001	MFT-1000		CCF-102	CT280A	
C12	.001		EF-001	MFT-1000		CCF-102	CT280A	
C13	.001 10%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
C14		#C662-123						
C15	8 NPO ±.5mmf	(5) †	NPO-SI 8.2		C10V82C			10TCC-V82
C16	68 N750		N750-DI 68	DTN-68	C10Q68U	CCTN-680	CN7-468	10TCU-Q68
C17	24 N150 5%	#C50070-8				*		
C18	47 N750 10%		N750-DI 47	DTN-47	C10Q47C	CCTN-470	CN7-447	10TCU-Q47
C19		#C662-123						
C20	5 N150 ±.5mmf	#CC20RH050D5				*		10TCR-V50
C21	5 N220 ±.5mmf	#CC20PJ050D5				*		10TCR-V50
C22	100 N1500	#C50070-6		TCL-100		*		
C23	100 N1500	#C50070-6		TCL-100		*		
C24	.001		EF-001	MFT-1000		CCF-102	CT280A	
C25	.001		EF-001	MFT-1000		CCF-102	CT280A	
C26	.005		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C27	.001		EF-001	MFT-1000		CCF-102	CT280A	
C28	100 N150 5%	#C50070-19				*		10TCP-T10
C29	.001 10%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
C30	.0027 10%		DI-2700		DPMS6D27	CCD-272		10TS-D27
C31	.005		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C32	.005		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C33	.005		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C34	.0027 10%		DI-2700		DPMS6D27	CCD-272		10TS-D27
C35	.005		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C36	.005		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C37	.0027 10%		DI-2700		DPMS6D27	CCD-272		10TS-D27
C38	.005		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C39	330 10%		DI-330	DD-331	L10T33	CCD-331	GP333	10TS-T33
C40	330 10%		DI-330	DD-331	L10T33	CCD-331	GP333	10TS-T33
C41	.005		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C42	330 10%		DI-330	DD-331	L10T33	CCD-331	GP333	10TS-T33
C43	.0033 10%		DI-3300		1R5D33	CCD-332	JL-233	10TS-D33
C44	.047 250V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C45	3 NPO 10%		NPO-DI 3.0	DTZ-3R3	C10V3C	CCTO-3R3	CNO-533	10TCC-V33
C46	100 N1500	#C50070-5				*		
C47	.047 250V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C48	.02		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C49	.02		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C50	2.2 10%		NPO-SI 2.2	TCZ-2R2	C10V22C	CCTO-2R2	CNO-522	10TCC-V22
C51	5 NPO 10%		NPO-DI 5.0	DTZ-4R7	C10V5C	CCTO-050	CNO-547	10TCC-V50
C52	100 N1500	#C50070-5		TCL-100		*		
C53	100 N1500	#C50070-5		TCL-100		*		
C54	10 NPO 5%		NPO-SI 10	TCZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C55	.005		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C56	.68mmf 10%		NPO-SI 6.8	TCZ-R68				
C57	.005		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C58	.005		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C59	.02		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C60	220 10%		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C61	.047 250V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C62	18 N470 10%	#C50070-13				*		
C63	.02		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C64	.1 250V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C65	.02		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C66	.1 250V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C67	.02		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C68	.01 600V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	5TM-S10

† Alternate Value # Fisher Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	FISHER PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	250K	½	R50103-1	AB-50	A47-250K-S	Q11-130	SU-46	AM Level
B	Shaft			AK-1	FKS-1/4	Not Req.	Not Req.	
R2A	250K	½	R50103-1	AB-50	A47-250K-S	Q11-130	SU-46	FM Level
B	Shaft			AK-1	FKS-1/4	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	IRC PART No.	WORKMAN TV PART No.	REMARKS	ITEM No.	RATING	IRC PART No.	WORKMAN TV PART No.	REMARKS
R3	100K				R31	820K			
R4	330K				R32	47K			
R5	330K				R33	100Ω			
R6	470K				R34	820K			
R7	1000Ω				R35	18K 1W			
R8	22Ω				R36	100Ω			
R9	2200Ω				R37	22K			
R10	47K				R38	1000Ω			
R11	1000Ω				R39	27K			
R12	470Ω				R40	180Ω			
R13	1000Ω				R41	82K			
R14	150Ω				R42	82K			
R15	47K				R43	2.2meg			
R16	1000Ω				R44	1meg			
R17	150Ω				R45	1meg			
R18	2.2meg				R46	22meg			
R19	1.5meg				R47	100K			
R20	47K				R48	4700Ω			
R21	27K				R49	820K			
R22	1000Ω				R50	1.8meg			
R23	3.9meg				R51	470K			
R24	270Ω				R52	22meg			
R25	1500Ω				R53	100K			
R26	1000Ω				R54	1.5meg			
R27	6800Ω				R55	330K			
R28	6800Ω				R56	820K			
R29	100K				R57	220Ω 5W	PW5-220	5W-SQ-220	
R30	47K				R58	220Ω 5W	PW5-230	5W-SQ-220	

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R59	820K			
R60	100K			

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R61	270Ω			
R62	22K			

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA FISHER PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	NOTES
L1	RF Choke (3.3uh)	L50066-8	BC-564	4608	RTC-8518	T858	① Wound on 100Ω
L2	FM Ant.	L726-124					
L3	RF Choke (1uh)	L50066-2	BC-561	4602	RTC-8515	T855	
L4	RF Choke (.56uh)	L50066-19	BC-560	4590	RTC-8513	T802	
L5	RF Choke (.56uh)	L50066-19	BC-560	4590	RTC-8513	T802	
L6	RF Choke	L629-180 ①					
L7	FM RF	L726-126					
L8	FM Osc.	AS726-123					
L9	RF Choke (1uh)	L50066-2	BC-561	4602	RTC-8515	T855	
L10	RF Choke (1.2uh)	L50066-3	BC-561	4602	RTC-8515	T855	
L11	RF Choke (1uh)	L50066-2	BC-561	4602	RTC-8515	T855	
L12	RF Choke (.56uh)	L50066-19	BC-560	4590	RTC-8513	T802	
L13	Fil. Choke (1uh)	L50066-2	BC-561	4602	RTC-8515	T855	
L14	1st FM IF	ZZ662-117	FM-254	1463	RTC-8599	T633	
L15	2nd FM IF	ZZ2987	FM-254	1463	RTC-8599	T633	
L16	Limiter	L670-145					
L17	Ratio Detector	ZZ592-170	FM-255	1465	RTC-8600	T635	
L18	Loopstick	L50210-26	BC-419	705-A		T532	
L19	AM RF	L50210-23					
L20	AM Osc.	L50210-22	BC-393	70-OSC	RTC-8647	T512	
L21	1st AM IF	ZZ50210-1					
L22	2nd AM IF	ZZ2984	BC-353	12-C2	RTC-8633	T608	

POWER RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA FISHER PART No.	RCA PART No.	SARKES TARZIAN PART No.	NOTES
M1	.070A	SR50253-3			

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA FISHER PART No. FUSE	FISHER PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M2	3AG	1A 250V S/B	F629-132		313001 (3AG 1A 250V) S/B	342001	MDL 1	HKP

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA FISHER PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	NOTES
M3	1N542	V-1N542		1N295	Ratio Det.
M4	1N542	V-1N542		1N295	

MISCELLANEOUS

ITEM No.	PART NAME	FISHER PART No.	NOTES
M5	Tuning Cap.	C726-116	FM, 2 Gang
M6	Tuning Cap.	C799-119	AM, 3 Gang (Ant. 10-505mmf, RF 10-503mmf, Osc. 7-138mmf)
M7	Switch	S843-126	Function Selector (Rotary Wafer Type) Includes Power Off-On
M8	Switch	S843-124	AM Bandwidth

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

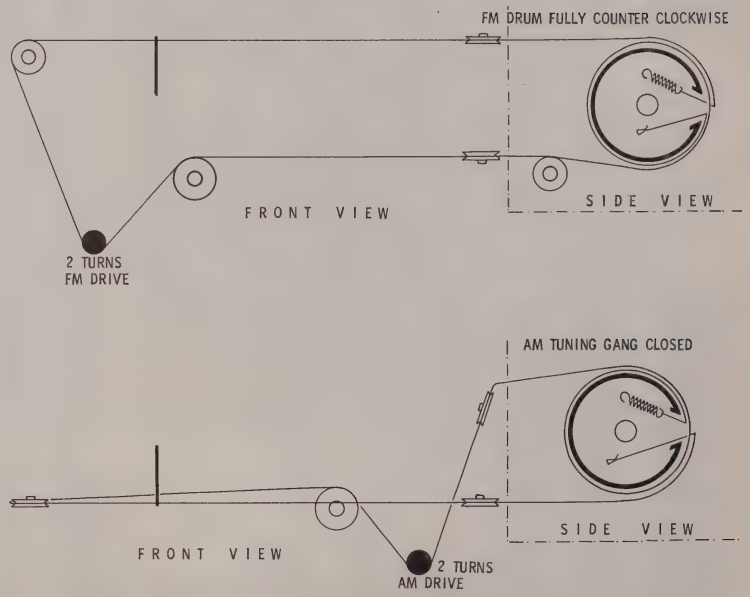
NAME	PART NO.	DESCRIPTION
Dial Glass	N843-109	
Knob	E50133-1	Tuning
Knob	E50133-2	Function, Bandwidth
Front Panel	AS843-108	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

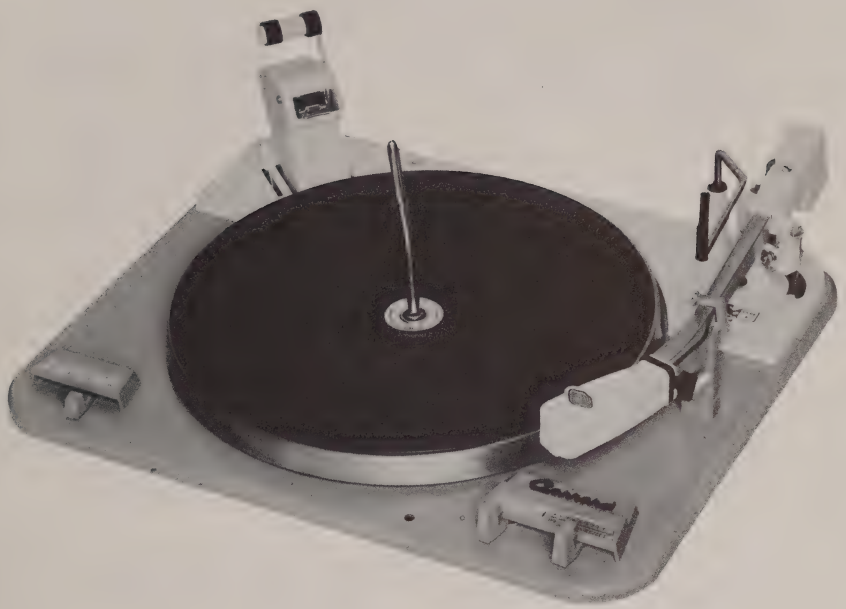
DIAL CORD STRINGING



PHOTOFACT® Folder

GARRARD
TYPE A

GARRARD
TYPE A



GARRARD
TYPE A

GENERAL INFORMATION

The Garrard Type A is a four-speed manual or automatic record changer. The changer will play up to six records of the same size and speed automatically. It will play 7", 10", and 12" records at 16 2/3, 33 1/3, 45, or 78 rpm.

A short spindle is supplied to play records manually, and a stepped spindle to play records automatically.

The changer shuts off automatically after the last record has been played.

Connect changer to an outlet supplying 100/130 or 200/250 volts, at 50 or 60 cycles, according to the motor pulley supplied.

Manufactured By:

The Garrard Engineering and Manufacturing Co. Ltd.
Swindon-Wiltshire-England

Distributed in the United States By:

Garrard Sales Corporation
80 Shore Road,
Port Washington, New York

SET 556 FOLDER 8

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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CQ499

CONTROLS

Manual On-Off Control

Moving this control to the "On" position releases the brake and applies power to the motor. Returning this control to the "Off" position removes the power to the motor and applies the brake to the turntable.

Automatic Control

Moving this control to the "On-Reject" position releases the turntable brake, applies power to the motor, and starts the change cycle. The record selector arm then swings in and feels the record so that the tone arm will set down on the lead-in groove of the record. Returning this control to "Off" position removes the power from the motor and applies the brake to the turntable.

Speed Selector

This control selects the desired speed: 16 2/3, 33 1/3, 45, or 78.

OPERATING INSTRUCTIONS

Manual Operation

1. Set the stylus for the type of record to be played.
2. Set the correct speed to be used by moving speed selector control to 78, 45, 33, or 16 rpm.
3. Insert the short spindle into the turntable center.
4. Move the record platform to the rear position and place record hold-down in the up position.
5. Place the record on the turntable and turn the changer on with the manual Off-On control. At the end of the recording, the tone arm will return to the rest position automatically.

Automatic Operation

1. Follow the steps 1 and 2 for manual operation.
2. Insert the stepped sloping spindle into the turntable center.
3. Set the record platform to the proper position: 10", or 12". Place records on the spindle and place the record hold -down on the records.
4. Start the changer by moving the Automatic Off-On Reject switch to the On-Reject position. The changer will play the records and shut off automatically after the last record.

To Reject a Record

A record can be rejected at any time. Move the Off-On Reject control to the On-Reject position and release.

Stopping

If it is desired to stop the changer before it has done so automatically, move the manual control to "Stop". If the changer is stopped while the pick-up is on the record, the changer will reject when turned on again.

CHANGE CYCLE

Observe the change cycle by manually rotating the turntable clockwise. The change cycle action can then be more easily followed and the function of parts more easily understood.

This changer has a velocity trip mechanism. The change cycle is started by the fast inward motion of the pickup arm when the needle enters the leadout groove at the end of the record.

As the pickup arm enters the leadout groove of the record, pickup arm lever assembly (109) strikes inter-lever unit (106). Friction plate (39) rotates and moves operating lever unit (40) so it will contact and ride up on turntable cam, raising stop lever assembly (49) so cam gear assembly (92) will engage the turntable gear.

As cam gear assembly (92) rotates, cam lever unit (95) rides on the bottom cam of gear assembly and moves the pickup arm lever assembly (109) outward so the pickup arm will clear the records. As the cam gear assembly continues to rotate, record selector arm (1) swings inward and contacts the edge of the record by action of the cam selector lever unit (93) riding on a pin on cam gear assembly (92). The bottom cam of the cam gear assembly pushes the record pushing pawl coupling link (98) causing the record pushing pawl (127) to move out and drop a record to the turntable.

After the record drops, the pickup arm is raised by action pickup cam assembly (115). As the pickup arm is raised and swings outward, a pin on pickup arm lever assembly (109) engages with control lever unit (66). The pickup arm is then pulled in against selector lever assembly by interselector lever spring (35). As cam gear assembly (92) continues its rotation, pickup cam assembly (115) is rotated far enough so pickup arm lever assembly (109) disengages interselector and the pickup arm sets down in the lead-in groove of the record.

The cam gear assembly (92) continues to rotate until it contacts stop lever assembly (49) and one cycle is completed.

When the last record has been played, the record selector arm (1) swings all the way in. When the record selector arm (1) swings in, it allows stop link (69) to move outward and the interselector lever is prevented from moving in by the lance on stop link (69). As cam gear assembly (92) continues its rotation, cam lever (96) is rotated by a pin on cam gear assembly (92) which in turn pivots stop catch lever (80) and releases switch lever assembly (47), cutting the power to the motor and allows the brake to contact the turntable.

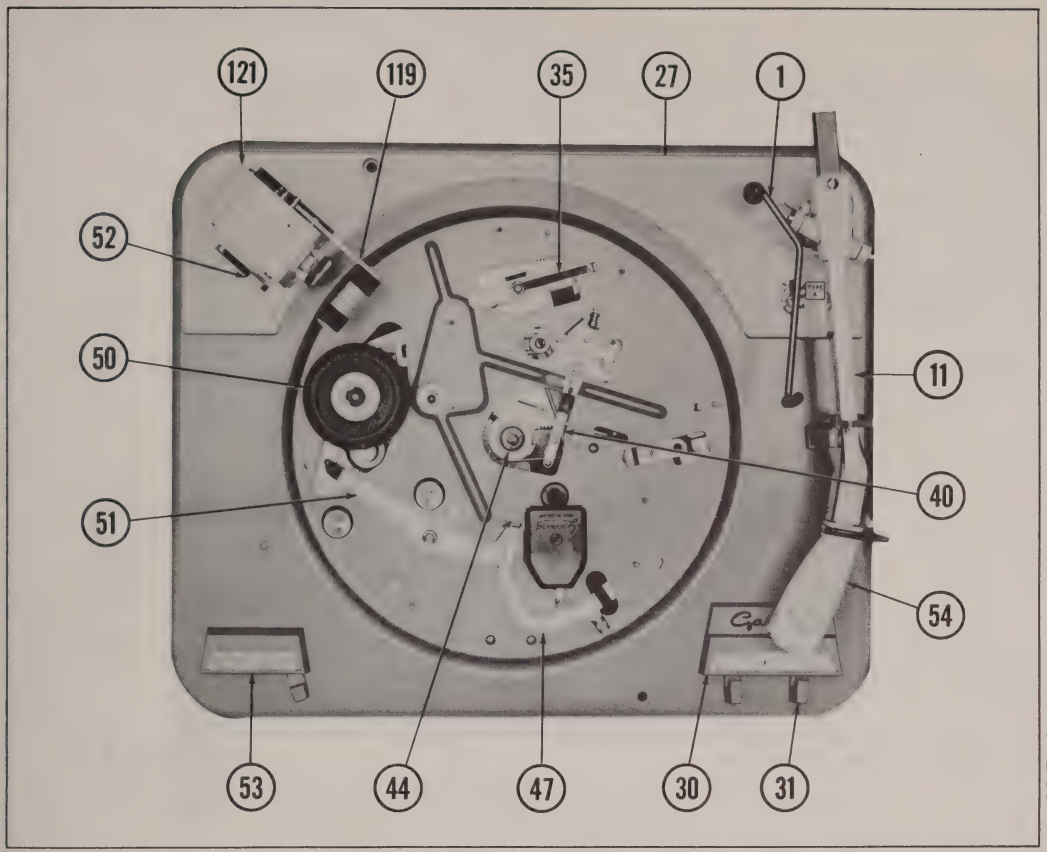

FIG.1 TOP VIEW OF MECHANISM WITH TURNTABLE REMOVED

ADJUSTMENTS

Pickup Arm Set-Down

As the pickup arm sets down on the record, it should land in the middle of the record edge. Rotate the turntable manually until the pickup is approximately 1/8" above the record. Turn screw (23) clockwise to move pickup inward and counterclockwise to move the pickup outward.

Pickup Height Adjustment

The distance the pickup lifts can be adjusted by turning the screw on top of the pickup arm. Place six 12" records on the turntable and adjust the height so that the pickup clears the record by 1/8". Turning the screw clockwise raises the pickup and turning the screw counterclockwise lowers the pickup.

To adjust the maximum height of the pickup, loosen nut on rear of pickup arm bracket and adjust screw until the pickup, when lifted manually, clears a record on the spindle by 1/16".

Stylus Pressure Adjustment

1. Loosen the stylus pressure adjusting screw (10) and allow the pointer to move to the maximum rear position.
2. Loosen the counterbalance weight screw and move the counterbalance weight until the arm balances. Tighten set screw.
3. Slide the stylus pressure screw (10) forward until the desired weight is indicated and tighten the screw.

Record Dropping Adjustment

When trouble is experienced with record dropping, first check for warped records or records of incorrect diameter. Check the record spindle to see that it has not been bent. Check the slope of the spindle to see that it is in line with the record platform. If it is not in line, loosen the two retaining screws (72 & 73) and line it up with the platform.

The record pushing pawl (127) setting should also be checked. The record pushing pawl should extend out flush with the edge of the record platform. To adjust the travel of the record pushing pawl, turn the eccentric adjusting screw on the platform link assembly until the proper travel is obtained.

Velocity Trip Adjustment

The automatic trip mechanism is of the velocity type; that is, it operates by the quick inward movements of the pickup arm when the pickup reaches the center lead-out groove of the record. The automatic trip is set to trip when the stylus reaches a radius of 2 9/16" from the center. If the automatic trip fails to operate, the pickup will remain running in the center of the record. To correct this, remove the turntable and raise the auto trip operating lever (40) by turning the adjusting screw one half turn in the clockwise direction. This will raise the auto trip operating lever (40) and enable it to engage the cam on the striker when the pickup runs into the record lead-out groove.

Cartridge Muting Switch

A cartridge muting switch is connected across the pickup cartridge to short circuit the pickup when the changer is not playing a record. The muting switch contacts should be closed except when the changer is in its playing position. Should this switch fail to operate, clean the contacts and insure that they make and break according to the position of the changer mechanism.

LUBRICATION

Motor bearings, turntable spindle, and idler wheel are of the oil retaining type and should need no oiling for a long period of time. When the need for oil is apparent, use it sparingly.

Apply a light coat of grease to all cam faces, pins, and rollers, and all lever pivots.

CLEANING

Clean all foreign matter from the turntable rim. Clean the idler wheel and motor pulley occasionally to remove any oil or grease from them to prevent slipping.

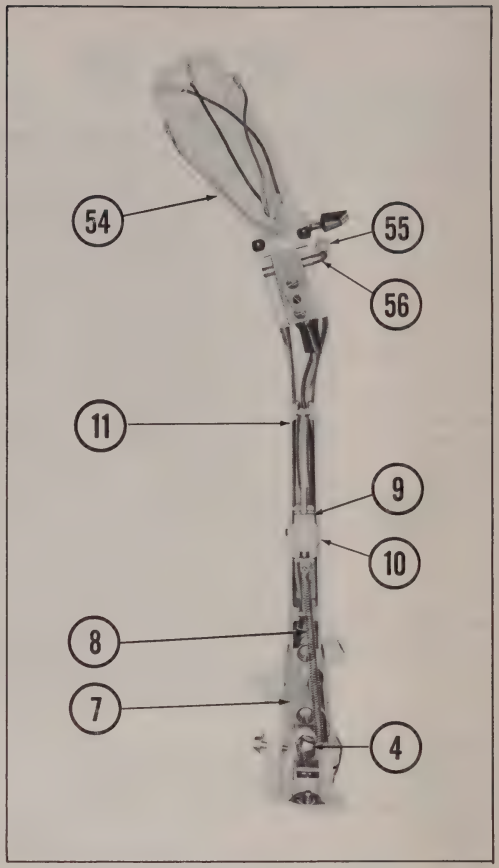

FIG.2 UNDERSIDE OF TONE ARM

TROUBLE CHART

Symptom	Cause	Remedy
Motor will not run.	1. No power reaching motor (103).	1. Check power leads for openings.
	2. Loose connection.	2. Inspect wiring to motor.
	3. Switch contacts bad.	3. Replace switch.
	4. Defective motor winding.	4. When connected for high voltage, the total resistance should be 780 ohms. When connected for low voltage, the total resistance should be 195 ohms.
Motor runs slow.	1. Motor bearings need lubrication.	1. Lubricate motor bearings with fine machine oil.
	2. Motor bearing out of alignment.	2. Give the motor a sharp blow with a piece of wood and self-aligning bearings will line up and free the motor shaft.
	3. Polarity of motor coils incorrect.	3. The polarity of the poles on which the coils are assembled should be the same, both north or both south.
	4. Motor coils open.	4. Replace motor coil.
Motor runs hot.	1. Motor defective.	1. Replace motor.
	2. Incorrect voltage.	2. Be sure the motor is connected for the correct power supply.

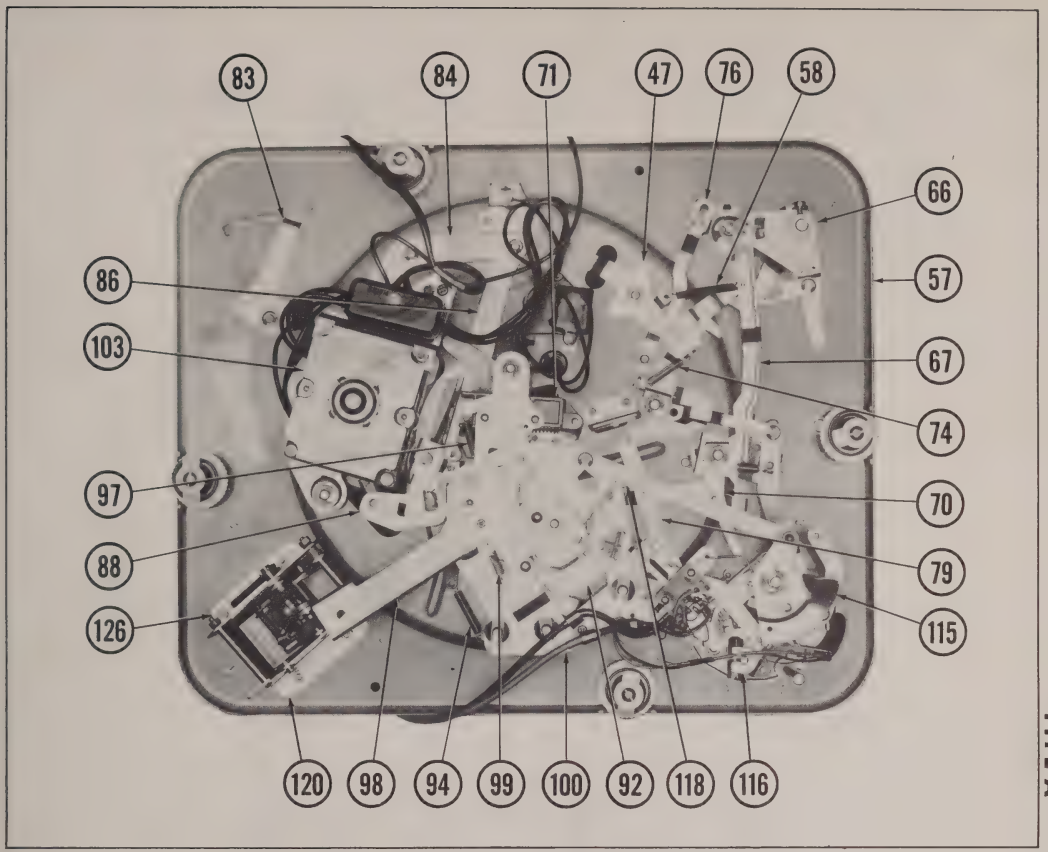

FIG.3 BOTTOM VIEW OF MECHANISM

TROUBLE CHART (CON'T.)

Symptom	Cause	Remedy
Pickup lands on record and jumps the first few grooves.	1. Stylus worn or wrong size. 2. Changer not level. 3. Pickup leads binding pickup arm.	1. Make sure stylus is set for type records being played. If stylus is worn or damaged, replace. 2. Level the changer. 3. Make sure the pickup leads are free in the slot in the pickup arm base assembly.
Tone arm does not set down onto the record.	1. Stylus pressure too light. 2. Pickup arm pivot too tight. 3. Lack of lubrication.	1. Adjust stylus pressure as outlined under "Adjustments". 2. Clean tone arm pivot and lubricate. 3. Put one drop of thin oil on pickup lifting rod and move it up and down. Put small amount of thick grease on pickup cam assembly (115).
Pickup arm begins to lower, then swings inward.	1. Lack of lubrication. 2. Excessive play in pickup arm vertical pivot.	1. Grease the face of pickup cam assembly (115) and oil the roller rivited to it. 2. Loosen the screw in the U-shaped lever under the pivot and move it upward and retighten the screw. Make sure the pickup arm moves freely after making any adjustments.
Changer does not cycle.	1. No lead-out groove on record.	1. Trip mechanism with the reject control.

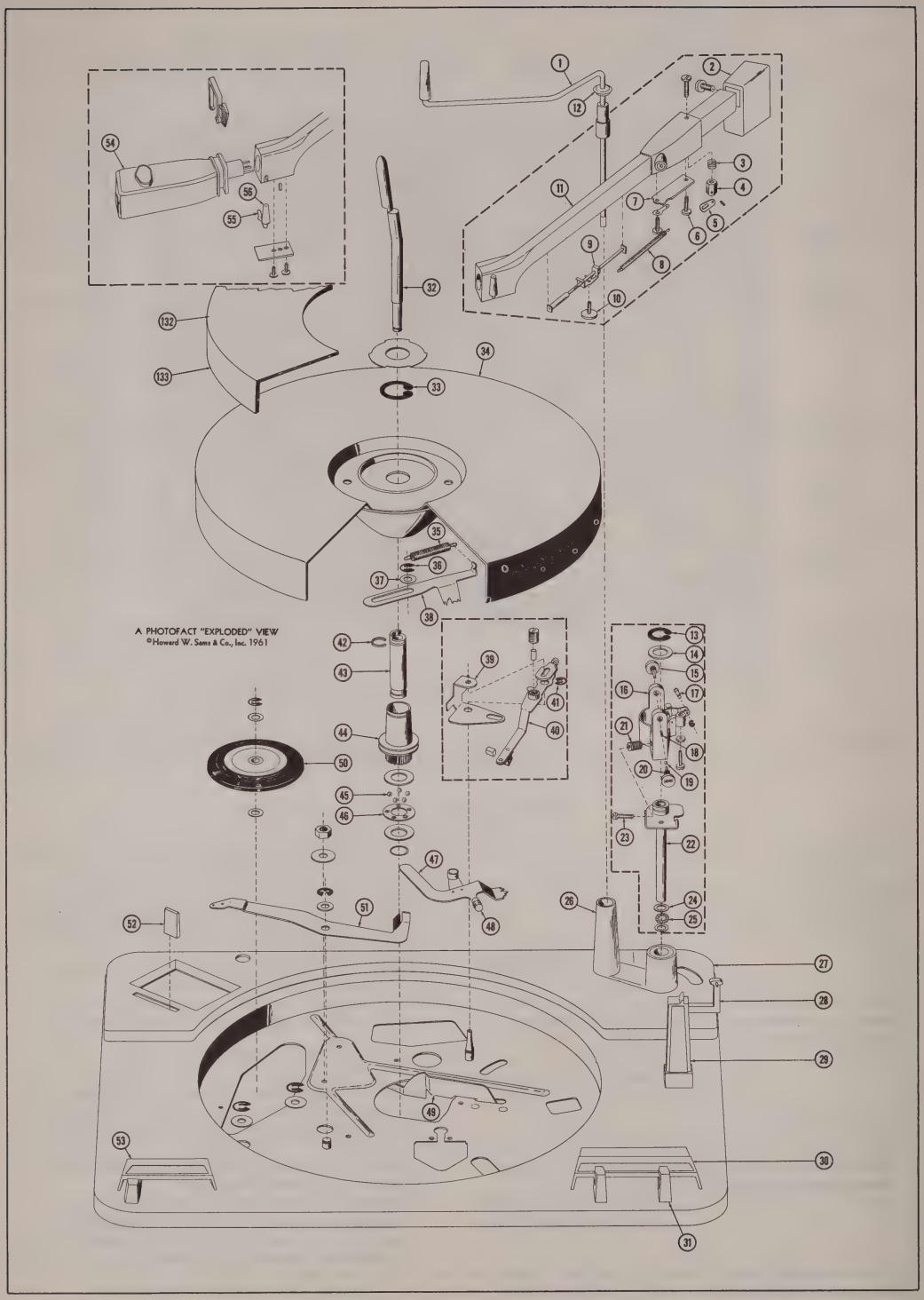

FIG.4A EXPLODED VIEW OF PARTS ABOVE BASE COVER

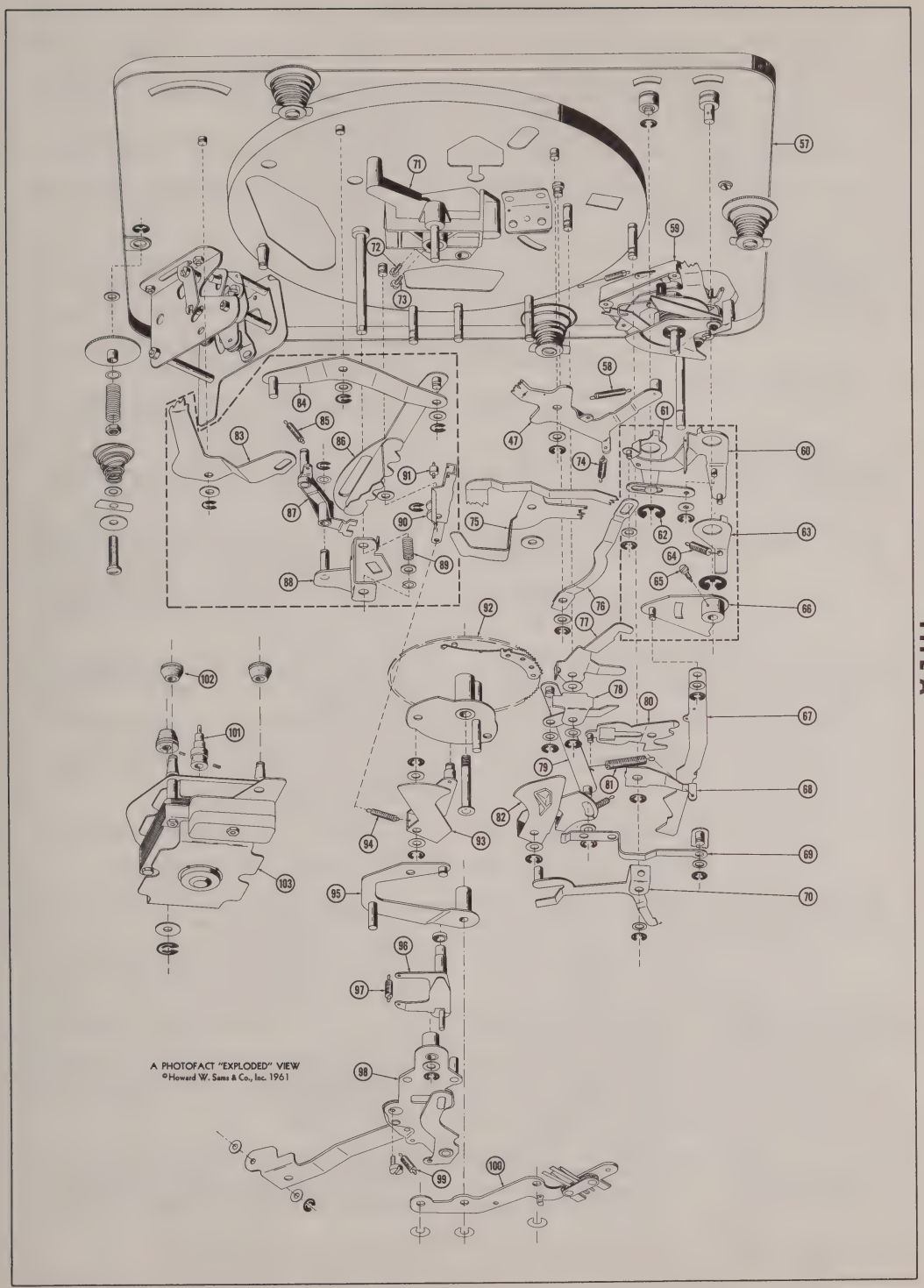

FIG. 4B EXPLODED VIEW OF PARTS BELOW UNIT PLATE

Symptom	Cause	Remedy
	2. Pitch of record lead-out groove not sufficient.	2. The lead-out groove of the record should not be less than 3/32".
	3. Automatic trip operating lever (40) height incorrect.	3. Make necessary adjustments as described in "Velocity Trip Adjustment" under "Adjustments".
	4. Automatic trip operating lever (40) binding.	4. Lift automatic trip operating lever (40) off the friction plate to see if it is free on its pivot. Do not lubricate.
When pickup arm nears center of record, it repeats in record groove.	1. Stylus worn.	1. Replace stylus.
	2. Stylus pressure too light.	2. Adjust stylus pressure. (See "Adjustments").
	3. Pickup leads too tight or not in guide clip.	3. Make sure the leads move freely in the slot of the pickup arm base.
	4. Automatic trip operating lever (40) set incorrectly.	4. Make necessary adjustments as described under "Velocity Trip Adjustments".
	5. Automatic trip operating lever (40) and pickup arm binding.	5. Check all associated levers for stiffness and see that they are not obstructed by any leads.
Turntable runs excessively fast or slow.	1. Motor pulley (101) size incorrect.	1. Check for correct pulley size. 50-cycle motor pulley is nickel plated and 60-cycle motor pulley is brass.
Erratic turntable speed.	1. Oil on driving surfaces.	1. Make sure all driving surfaces are free of oil.
	2. Motor pulley (101) loose.	2. Make sure motor pulley (101) is in correct position and then tighten both set screws.
	3. Motor pulley (101) out of position.	3. Position motor pulley (101) so the idler wheel (50) is about 1/64" above the adjacent pulley step.
Wow.	1. Rubber turntable mat not in correct position.	1. Raise the rubber turntable and check to see that triangular mark coincides with the one on the turntable.
	2. Dirt on inside surface of turntable rim.	2. Remove turntable and clean inside rim surface.
	3. Turntable spindle tight.	3. Remove turntable and clean and lubricate spindle.
	4. Flat spots on idler wheel (50).	4. Replace idler wheel (50).
	5. Motor pulley (101) loose.	5. Tighten the two set screws in the motor pulley (101).
	6. Bent motor shaft or unbalanced rotor.	6. Replace the rotor and shaft assembly.
Turntable does not turn when motor is running.	1. Oil on driving surfaces.	1. Clean all driving surfaces so they are free of oil.
	2. Inter-speed lever unit (70) binding.	2. Check to see if motor leads are not touching the inter-speed lever unit (70) and put a drop of oil on the bracket pivot.
Fails to turn off when last record has played.	1. Lubrication of levers required.	1. Lubricate the bearing faces of all pins and levers.
	2. Levers out of position or rubbing.	2. If any levers are bent, remove them and bend to correct position.
	3. Friction adjusting screw (107) on kick-out lever too tight.	3. Turn friction adjusting screw clockwise to reduce friction.
Changer turns off without playing record.	1. Plastic cap (12) not on record selector arm.	1. Make sure the plastic cap (12) is in position and pressed down tight on record selector arm.
	2. Control knob and levers not free.	2. Lubricate pivot points and where levers slide.
Pickup arm lands too far in or out.	1. Pickup arm out of adjustment.	1. See "Pickup Arm Set-Down".

Symptom	Cause	Remedy
	2. Selector arm not selecting correct set-down position.	2. Increase the friction on the record selector arm (1) by turning friction adjusting screw (130) a small amount.
	3. Damaged or missing springs.	3. Check to see that the springs are attached to the levers. Replace if damaged.
	4. Record selector arm damaged or out of position.	4. Check the record selector arm to see that the plastic cap is vertical. When in rest position, the arm should be 6 5/16" from center of turntable.
Record will not drop.	1. Spindle not in line with record platform.	1. Check that the step spindle slope is on the center line of the platform. Make adjustment by loosening the two spindle retaining screws (72 & 73) and rotating the spindle until properly aligned.
	2. Record pushing pawl not free in guide.	2. Clean the platform face and record pushing pawl. Lubricate them with a thin coat of oil.
	3. Records not of standard size.	3. Check the record dimensions to see that they are of standard size.
	4. Records warped.	4. Check to see if records are warped.
	5. Incorrect Record Platform position.	5. Place a record on the spindle. 1/8" of record should rest on the platform. Turn the platform adjusting screw (127) to position the platform.
Two records drop together.	1. Damaged record spindle.	1. Check the spindle to see if it has been bent or damaged.
Mechanical noise.	1. Lack of lubrication.	1. Lubricate all cam surfaces, bearings, and operating pins.
	2. Flat spots on idler wheel (50).	2. Replace idler wheel (50).
	3. Loose levers.	3. Check all levers for tightness.
Rumble.	1. Lack of lubrication.	1. Lubricate turntable bearings, idler wheel shaft and motor.
	2. Defective motor mountings.	2. If motor mounts have become hardened or damaged, replace them.
	3. Motor power supply leads preventing motor from floating freely.	3. Check that there is slack in the motor leads.
	4. Dirty idler wheel.	4. Lightly scrape the driving surface of the idler wheel (50) to remove all dirt.
	5. Worn idler wheel (50).	5. Replace idler wheel (50).
	6. Motor pulley (101) out of position.	6. Make sure the idler wheel (50) is riding squarely on steps of pulley (101).
	7. Idler wheel tension spring (85) too strong.	7. Stretch or replace idler wheel tension spring (85).
	8. Rotor shaft bent or motor pulley (101) defective.	8. Replace the rotor or motor pulley (101).
Pickup will not track.	1. Levers not clearing.	1. Check to see that the roller on the lever connected to the pickup arm spindle is clearing the lever above it.
Pickup arm remains in the raised position.	1. Spring on pickup arm lifting arm out of position.	1. Check to see that the compression spring on the pickup arm lifting arm has not slipped to one side. Position the compression spring around the lifting spindle and make sure the rod moves freely.

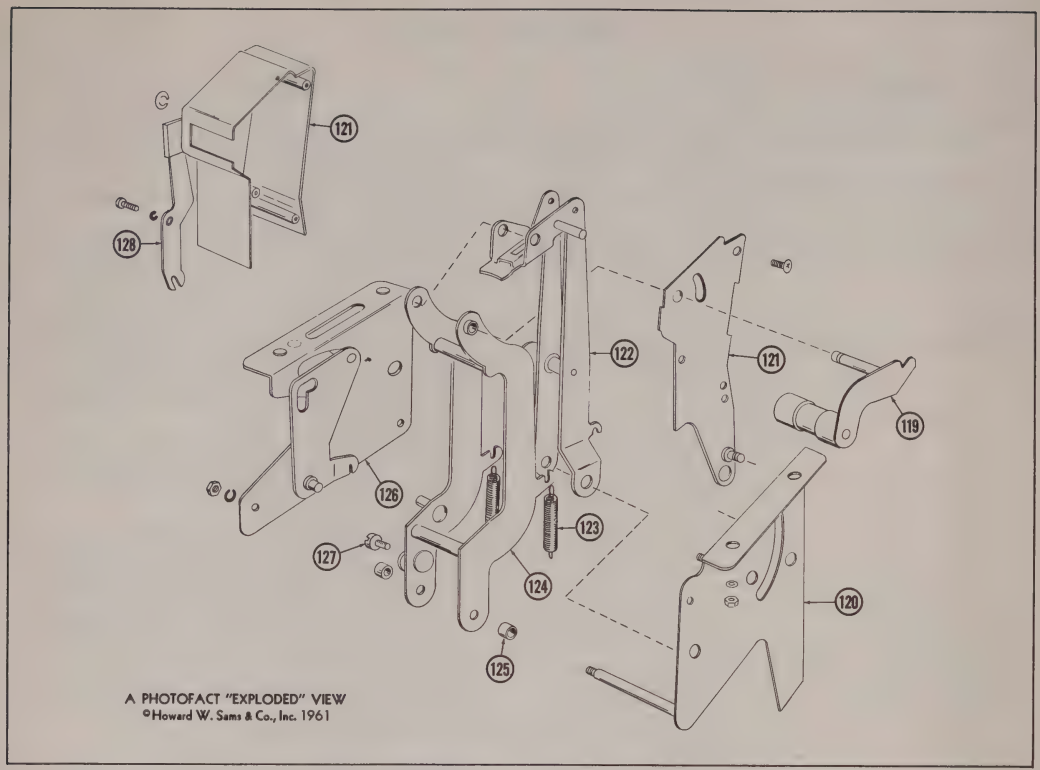

FIG.4C EXPLODED VIEW OF RECORD PLATFORM ASSEMBLY

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	B. 57487	Selector Arm	28	A. 57587	Latch Unit
2	A. 57517	Counterbalance Weight	29	A. 57758	Pickup Rest Base
3	A. 41883	Spring	30	B. 56317	Control Cover Unit
4	A. 57576	Locator Assembly	31	B. 56393	Control Knob
5	A. 43820	Circlip	32	B. 52764	Record Spindle
6		Screw	33	A. 53176	Retaining Clip
7	A. 57535	Clamp Plate	34	B. 53394	Turntable
8		Spring	35	A. 41631	Selector Spring
9	A. 57531	Adjuster	36	A. 41723	Spring Clip
10	A. 44102	Clamp Screw	37	A. 40537	Washer
11	A. 57537	Pickup Arm	38	A. 57477	Selector Link
12	A. 57491	Selector Cap	39	A. 57447	Friction Plate
13		Retaining Ring	40	A. 56616	Operating Lever Unit
14	A. 42548	Spring Washer	41	A. 41723	Spring Clip
15	A. 57529	Pivot Screw Assembly	42	A. 45372	Retaining Coil
16	A. 57513	Pivot Bracket	43	B. 52898	Fixed Spindle
17	A. 57532	Pivot Pin	44	A. 52762	Turntable Spindle Unit
18	A. 41880	Spring	45	A. 43201	Ball Bearings (5)
19	A. 43213	Ball	46	A. 51224	Ball Bearing Race
20	A. 57529	Pivot Screw Assembly	47	B. 58047	Switch Lever Assembly
21	A. 41850	Spring	48	A. 45064	Felt Pad
22	A. 57474	Pickup Spindle Unit	49	A. 57858	Stop Lever Assembly
23		Screw	50*	B. 53883*	*Idler Wheel
24		Washer	51	A. 57816	Tension Lever
25	A. 43204	Ball Bearings	52	A. 57526	Knob
26		Washer	53	A. 56318	Speed Cover Unit
27	A. 57788	Base Cover	54	A. 56804	Pickup Head

(CONTINUED ON PAGE 12)

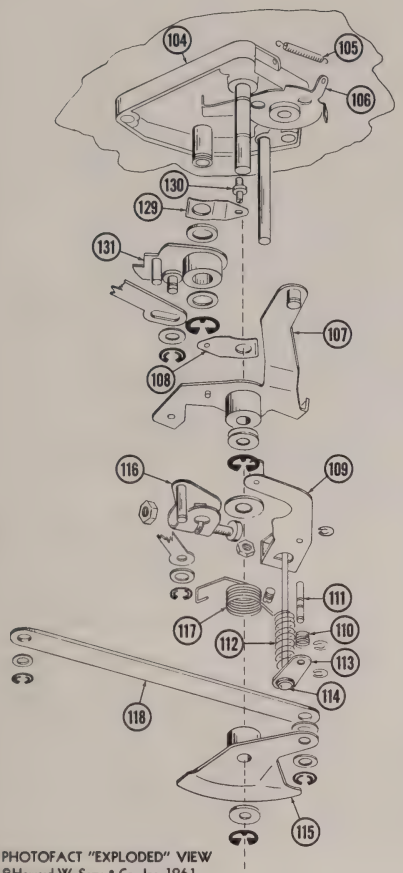

FIG.4D EXPLODED VIEW OF PICKUP ARM PIVOT ASSEMBLY

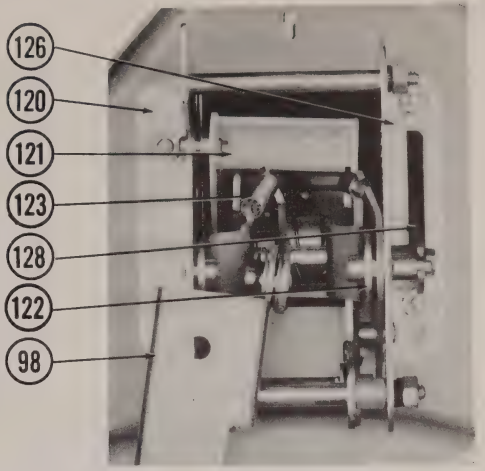

FIG.5 RECORD PLATFORM ASSEMBLY

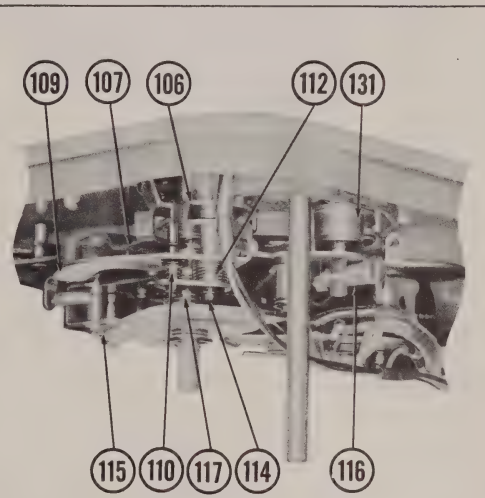

FIG.6 PICKUP ARM PIVOT ASSEMBLY

MECHANICAL PARTS LIST (CON'T.)

Ref. No.	Part No.	Description
55	A. 57164	Locking Spindle
56	A. 57148	Knob
57	C. 57401	Unit Plate
58	A. 41631	Spring
59		Pickup Arm Pivot Assembly
60	A. 56331	Return Lever
61	A. 56385	Manual Lever
62		Retaining Clip
63	A. 56408	Start Lever
64	A. 41630	Spring
65	A. 44076	Screw
66	A. 56322	Control Lever
67	A. 57421	Control Link
68	A. 56359	Fixing Plate
69	A. 54662	Stop Link
70	A. 57451	Inter Lever
71	A. 57428	Turntable Spindle Housing Unit
72	A. 40155	Turntable Spindle Set Screw
73	A. 40317	Turntable Spindle Set Screw
74	A. 41503	Spring
75	A. 57481	Resetting Lever
76	A. 57434	Switch Link
77	B57418	Catch Lever
78	B-57453	Stop Cam Lever
79	A. 57448	Link Unit
80	A. 56627	Stop Catch Lever Unit
81	A. 41845	Spring
82	A. 57478	Impulse Lever Unit
83	A. 57405	Speed Lever Unit
84	A. 57506	Interspeed Lever Unit
85	A. 41792	Idler Wheel Tension Spring
86	B. 56309	Speed Cam Unit
87	A. 56570	Spindle Unit
88	A. 57798	Support Lever Assembly
89	A. 41841	Lifting Spring
90	A. 56306	Index Lever Unit
91	A. 56308	Roller
92	A. 57430	Cam Assembly
93	A. 57518	Cam Selector Lever Assembly
94	A. 41848	Spring

Ref. No.	Part No.	Description
95	A. 57459	Cam Lever Unit
96	A. 53087	Center Lever Assembly
97	A. 41506	Spring
98	B. 52865	Platform Link Assembly
99	A. 41759	Spring
100	A. 57574	Bridge Assembly
101	A. 55644	Motor Pulley (60 Cycle)
102	A. 43123	Flexible Motor Mount (3)
103	B. 57520	Motor
104	B. 57466	Pickup Base Unit
105	A. 41630	Spring
106	A. 57470	Inter Selector Lever
107	A. 57462	Kick-Out Lever Unit
108	A. 41844	Friction Spring
109	A. 57471	Pickup Arm Lever Assembly
110	A. 41796	Return Spring
111	A. 54685	Lifting Pin
112	A. 41833	Friction Spring
113	A. 54689	Lifting Plate
114	A. 56669	Plastic Cap
115	A. 56585	Pickup Cam Unit
116	A. 57454	Selector Arm Lever Unit
117	A. 41882	Spring
118	A. 57590	Cam Link Unit
119	A. 50765	Record Hold Down
120	B. 57415	Rear Bracket Assembly
121	C. 57420	Platform Cover
122	A. 50740	Platform Unit
123	A. 41506	Spring
124	A. 57540	Platform Support Unit
125	A. 50914	Collar
126	A. 57441	Front Bracket Unit
127		Screw
128	A. 57503	Platform Control Lever Unit
129	A. 41878	Friction Spring
130	A. 40035	Adjusting Screw
131	A. 57469	Sleeve
132	C. 57422	Turntable Cover
133	C. 57578	Heavy Turntable

* Walsco Replacement Part #1497

PHOTOFACT® Folder

GRUNDIG MAJESTIC MODEL 5017U

GRUNDIG MAJESTIC
MODEL 5017U

GRUNDIG MAJESTIC
MODEL 5017U

TRADE NAME	Grundig Majestic Model 5017U
IMPORTER	Majestic International Sales, 743 N. LaSalle Street, Chicago 10, Illinois
TYPE SET	AC Operated, 10 Tube FM-BC-LW-SW Receiver
POWER SUPPLY	110 - 120/220 Volts AC, 50-60 Cycles RATING 80 Watts, . 75 Amp. @ 117 Volts AC
TUNING RANGES—FREQ. MOD.	88 — 108MC LONG WAVE 135-350KC
BROADCAST	510—1620KC SHORT WAVE 5. 9-16MC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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KK742

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use only enough generator output to provide a usable indication.
Suggested Alignment Tools: A1 thru A7, All thru A22... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532
A23, A24..... GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528
A25, A26, A27..... GENERAL CEMENT #9440

AM ALIGNMENT — SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 2 (grid) of AM Mixer. Low side to chassis.	460KC (400∿ 30% AM)	(AM) Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4, A5, A6	Adjust for maximum output.
2.	High side to AM antenna terminal thru 470Ω. Low side to chassis.	"	"	"	A7	Adjust for MINIMUM output.
3.	"	1600KC	1600KC	"	A8, A9	Adjust for maximum output.
4.	"	600KC	600KC	"	A10, A11	"
5.	"	150KC	(LW) 150KC	"	A12, A13	"
6.	"	6MC	(SW) 6MC	"	A14, A15	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM — SELECTOR IN FM POSITION

Connect two matched 100K (±1%) resistors in series from point Ⓐ to chassis. The junction of these two resistors is alignment point Ⓒ as shown on the schematic.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	Across FM antenna terminals.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe to point Ⓐ. Common to chassis.	A16, A17 A18, A19 A20, A21 A22	Adjust for maximum deflection.
8.	"	"	"	DC probe to point Ⓑ. Common to point Ⓒ.	A23	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE — SELECTOR IN FM POSITION

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
7.	Across FM antenna terminals.	10.7MC (450KC Swp)	(FM) Point of non-interference.	Vert. amp. to point Ⓐ. Low side to chassis.	A16, A17 A18, A19 A20, A21 A22	Disconnect stabilizing capacitor C2. Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Reconnect C2.
8.	"	"	"	Vert. amp. to point Ⓑ. Low side to chassis.	A23	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A16 for maximum amplitude and straightness of cross-over lines.

FM RF ALIGNMENT — SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
9.	Across FM antenna terminals with 120Ω in each lead.	108MC (Unmod.)	(FM) 108MC	DC probe to point Ⓐ. Common to chassis.	A24 A25	Adjust for maximum deflection.
10.	"	88MC	88MC	"	A26, A27 A28	Adjust for maximum deflection. Repeat Steps 9 and 10.

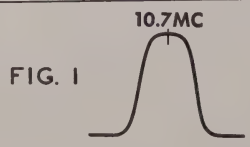


FIG. 1

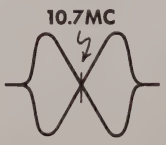
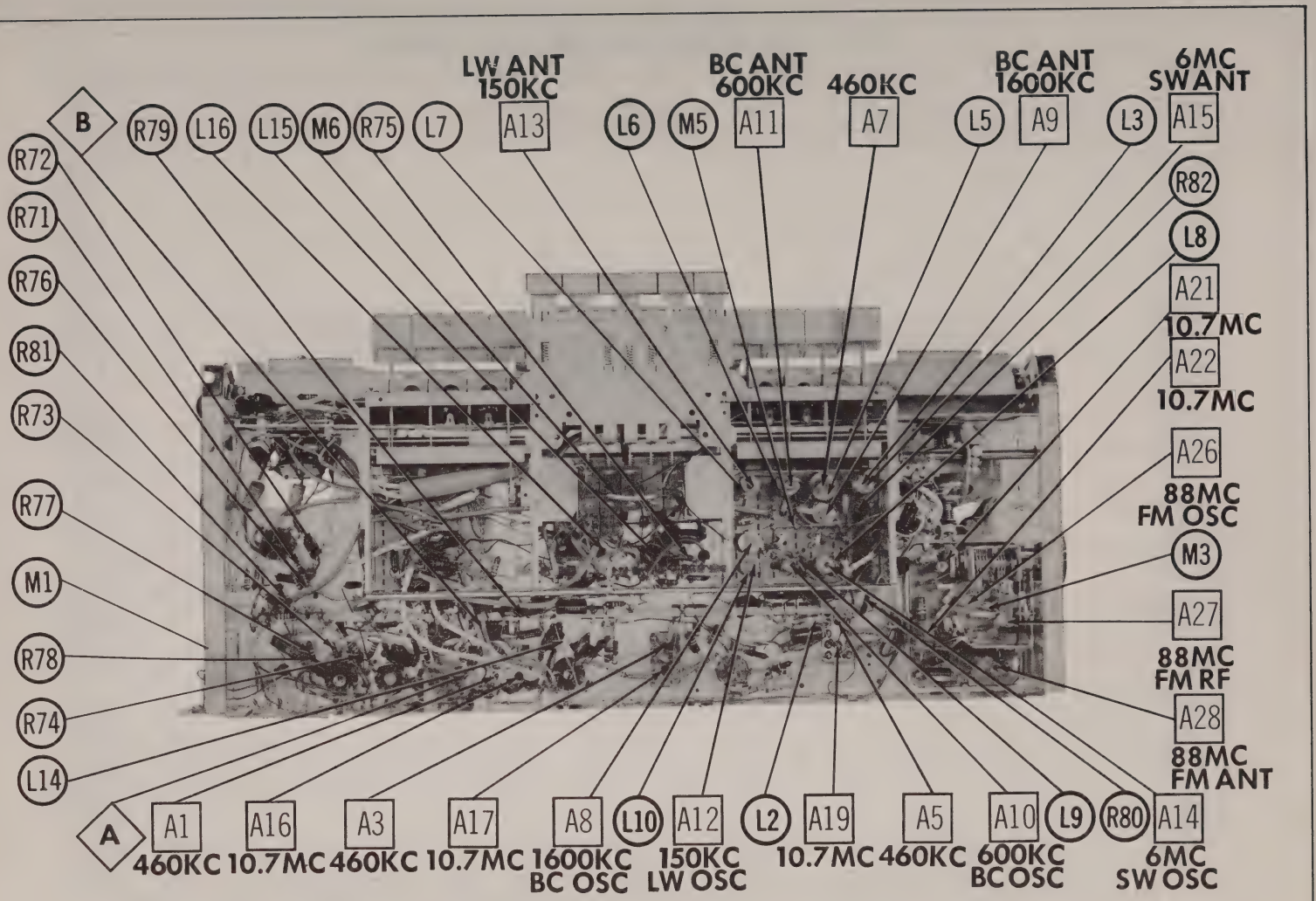
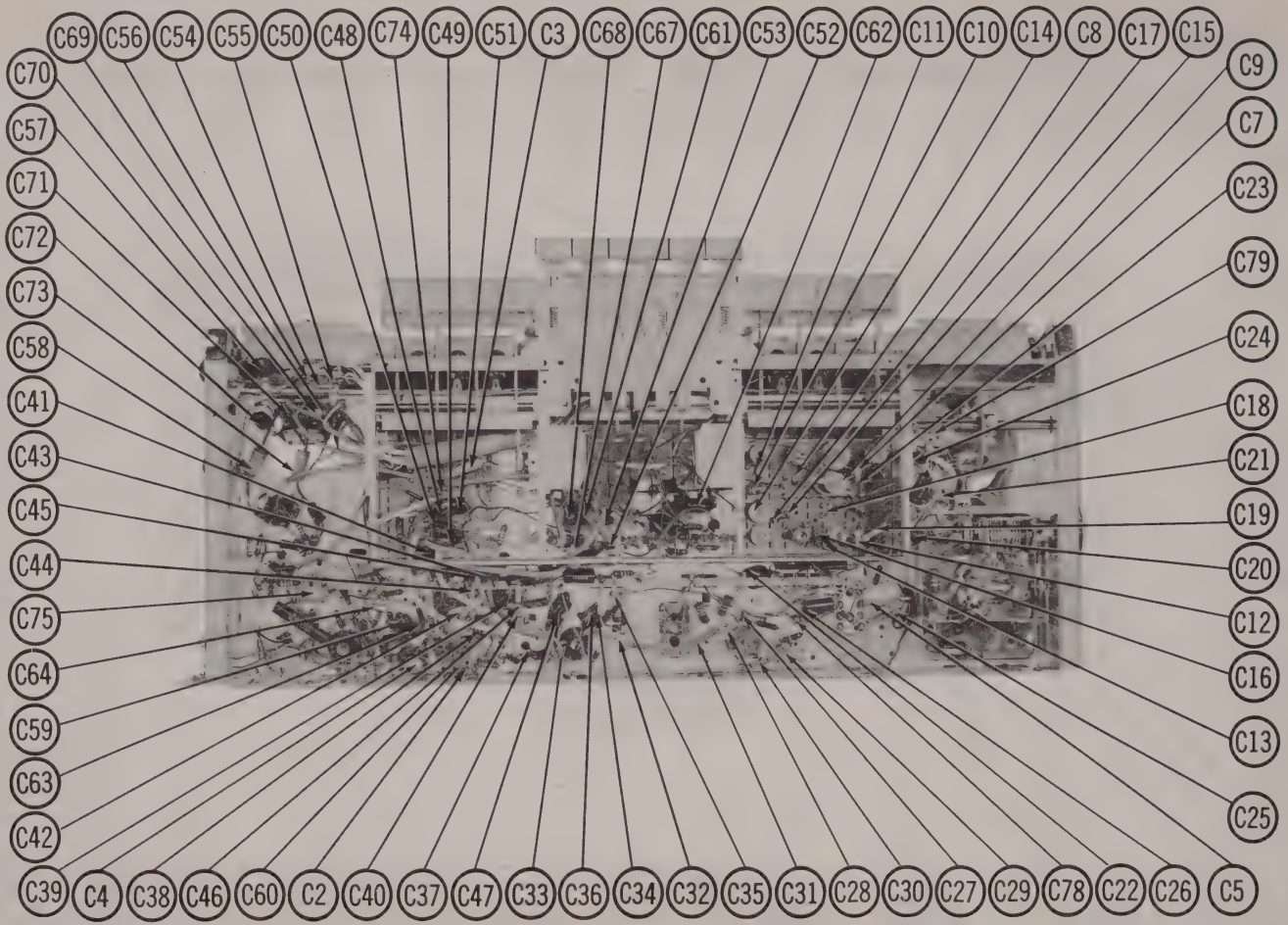


FIG. 2

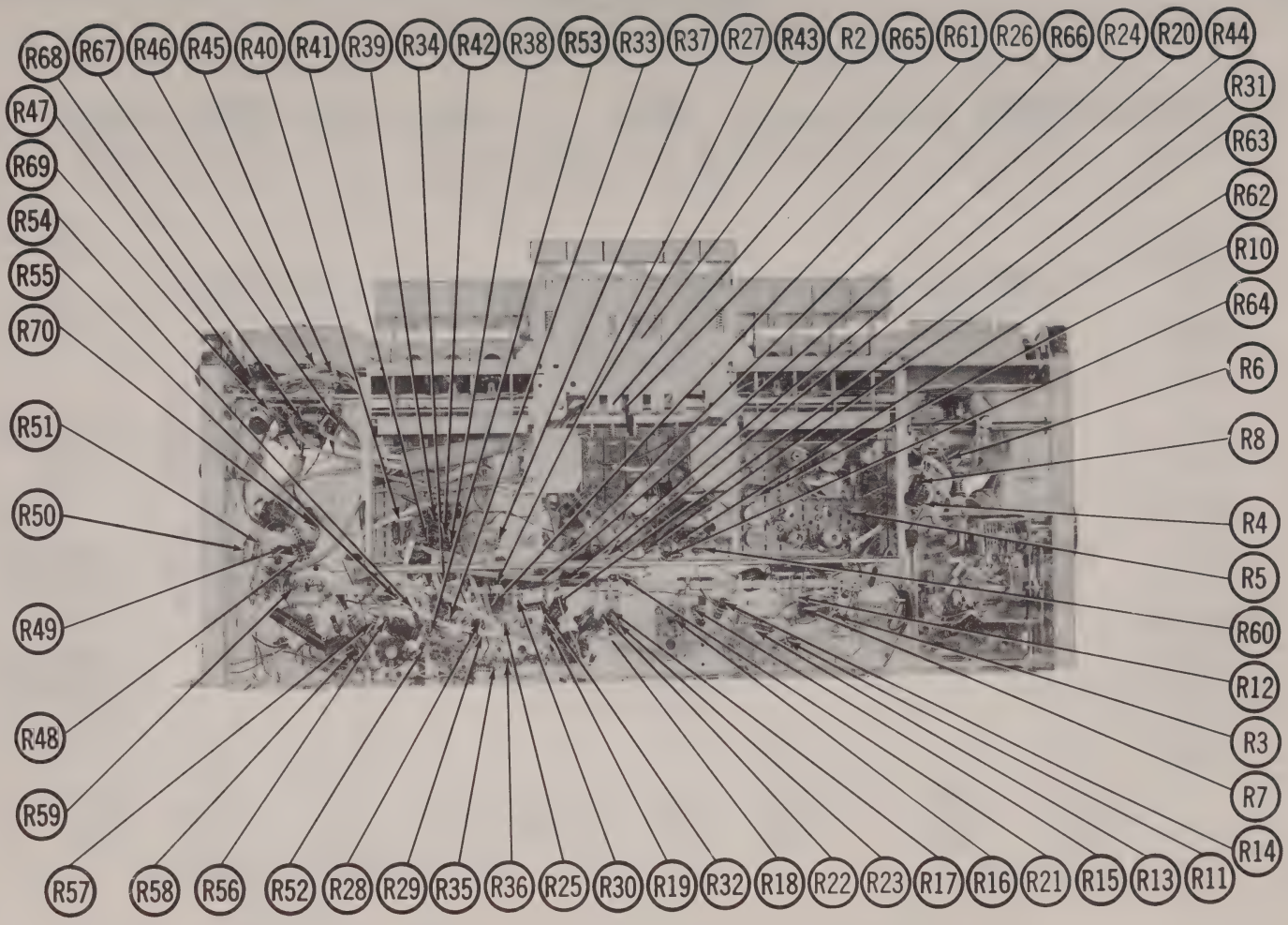


CHASSIS BOTTOM VIEW-ALIGN., INDUCTOR, RESISTOR (R71-R82) & MISC. IDENT.

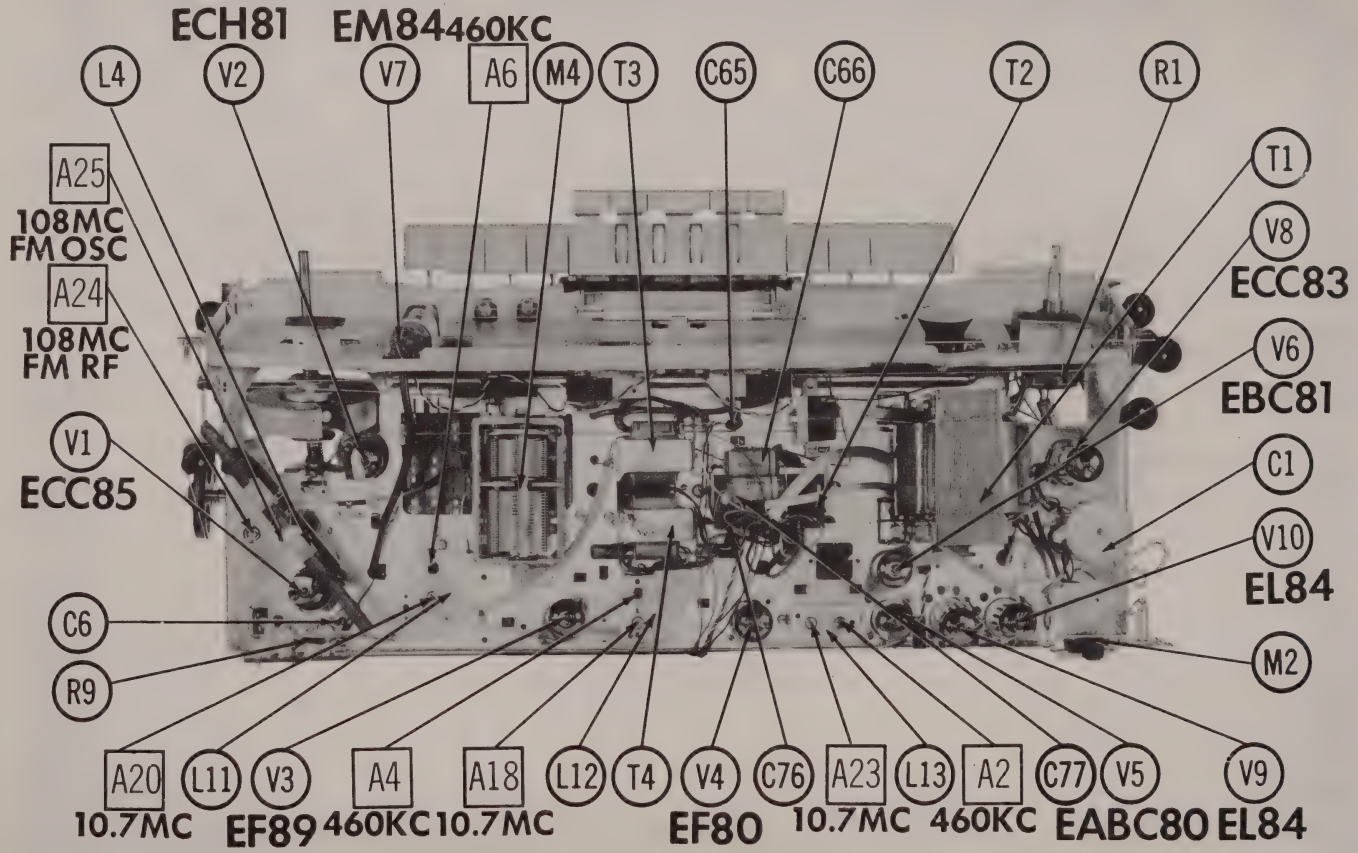
GRUNDIG MAJESTIC
MODEL 5017U



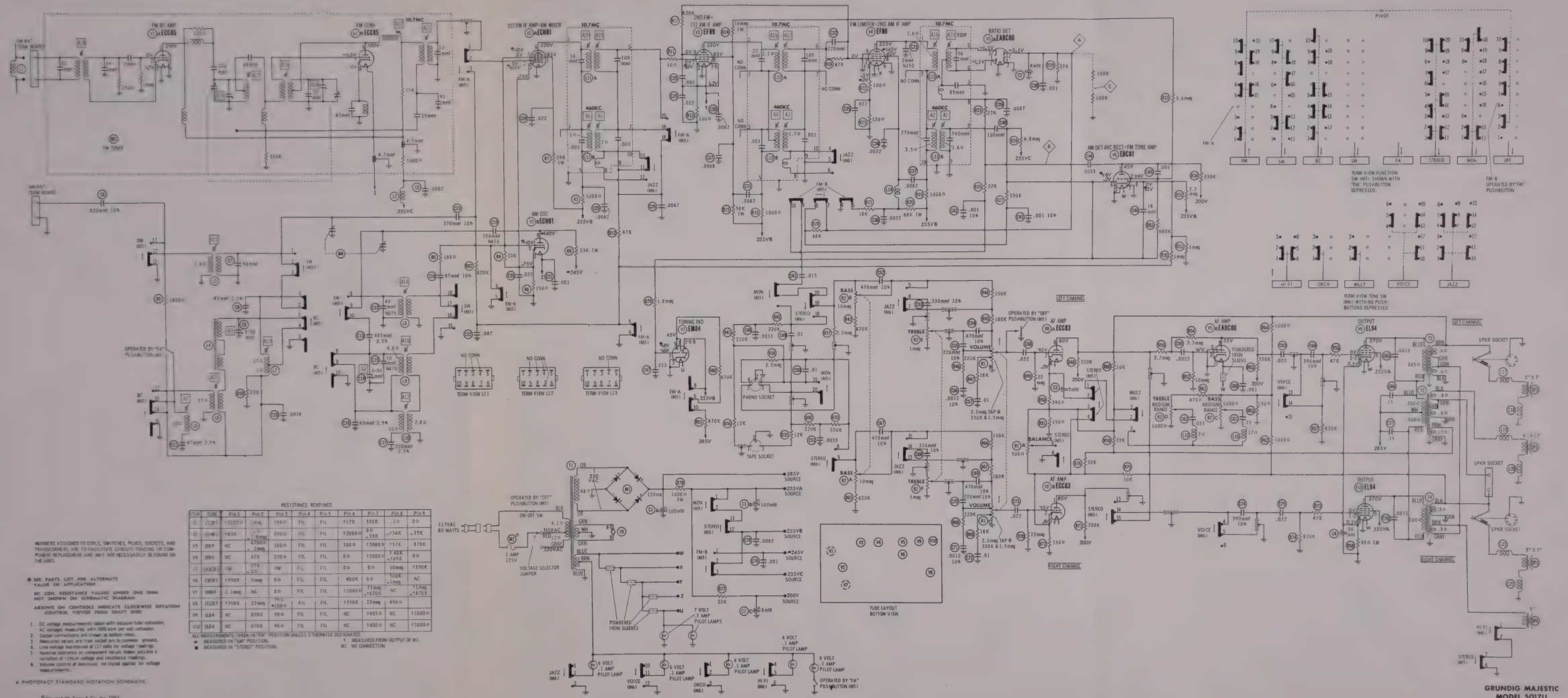
CHASSIS BOTTOM VIEW-CAPACITOR IDENT.



CHASSIS BOTTOM VIEW-RESISTOR IDENT. (R2-R70)



CHASSIS-TOP VIEW



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC85	1000Ω	1meg	150Ω	FIL	FIL	↑17K	330K	.10	0Ω
V2	ECH81	↑40K	1.8meg	150Ω	FIL	FIL	↑2000Ω	0Ω ↓33K	↑134K	↓33K
V3	EF89	NC	4700Ω ↓2meg	100Ω	FIL	FIL	100Ω	↑2000Ω	↑57K	870K
V4	EF80	NC	47K	220Ω	FIL	FIL	0Ω	↑2000Ω	↑40K ↓16K	0Ω
V5	EABC80	INF	27K ↓22K	INF	FIL	FIL	0Ω	0Ω	10meg	↑350K
V6	EBC81	↑350K	1meg	0Ω	FIL	FIL	400K	0Ω	500K ↓1meg	NC
V7	EM84	2.1meg	NC	0Ω	FIL	FIL	↑1000Ω	11meg ↓470K	NC	↑1meg ↓470K
V8	ECC83	↑350K	22meg	75Ω ●100Ω	FIL	FIL	↑350K	22meg	490Ω	
V9	EL84	NC	870K	90Ω	FIL	FIL	NC	↑405Ω	NC	↑1000Ω
V10	EL84	NC	870K	90Ω	FIL	FIL	NC	↑400Ω	NC	↑1000Ω

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
● MEASURED IN "AM" POSITION.
■ MEASURED IN "STEREO" POSITION.
↑ MEASURED FROM OUTPUT OF M3.
NC NO CONNECTION

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (COUNTER) VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (GENERAL ELECTRIC • RAYTHEON • SYLVANIA)
V1	FM RF Amp. -FM Conv.	ECC85
V2	1st FM IF Amp. -AM Mixer-AM Osc.	ECH81
V3	2nd FM IF Amp. -1st AM IF Amp.	EF89
V4	FM Limiter-2nd AM IF Amp.	EF80
V5	FM Ratio Det. -Left Ch. AF Amp.	EABC80
V6	AM Det. -AVC Rect. - FM Tone Amp.	EBC81
V7	Tuning Indicator	EM84
V8	Left Channel AF Amp. - Right Channel AF Amp.	ECC83
V9	Left Channel Output	EL84
V10	Right Channel Output	EL84

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	Grundig Majestic PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1A	▲100	350		AFH3-29-85	C0238	XC3-34	FP332.4	TMT-3447	TVL-3689.3
B	■100	350							
C	▲8	350							
C2	4	70		PRS1400	NLW4-150	MT1-4	TT80X4	MLV5-100	TE-1403
C3	5	12		PTT51	NLW5-15	MT1-3	TT12X5	MLV5-12	TE-1127
C4	50	12		PTT59	NLW50-15	MT1-16	TT15X50	MLV50-12	TE-1133

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	.0082			DD-822	HVE16D8	CCD-822	B-282	BL-D80
C6	820 10%			DD-821	5R5T82	CCD-821	GP382	10TS-T82
C7	56		SI 56	D6-560	L10Q56	CCD-560	GP456	10TS-Q56
C8	43 2.5%			TCZ-43		CM-15E-430G		
C9	3-30							
C10	.0018		SI 1800	D6-182	L10D18	CCD-182	B-218	10TS-D18
C11	47 2.5%			TCZ-47		CM-15E-470G		
C12	40 N075					*		
C13	485 2.5%							
C14	3-30							
C15	10 N470					*		
C16	43 2.5%			TCZ-43		CM-15E-430G		
C17	220 2.5%			TCZ-220		CM-15E-221G		
C18	47 10%		NPO-SI 47	D6-470	L10Q47	CCD-470	GP447	10TS-Q47
C19	150 N470					*		
C20	.022 500V		P688N-022	DD-203	CUB6S22	6DP-2-223	GEM-6122	6TM-S22
C21	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C22	.047 250V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C23	270 10%		NPO-SI 270	D6-271	L10T27	CCD-271	GP327	10TS-T27
C24	.022 250V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C25	.0082			DD-822	HVE16D8	CCD-822	B-282	BL-D80
C26	.0047 500V		P688N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C27	.0068 500V		P688N-0068	D6-682	CUB6D68	6DP-1-682	GEM-6268	6TM-D68
C28	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C29	.022 250V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C30	.0082			DD-822	HVE16D8	CCD-822	B-282	BL-D80
C31	.0082			DD-822	HVE16D8	CCD-822	B-282	BL-D80
C32	220		SI 220	D6-221	L10T22	CCD-221	B-322	10TS-T22

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C33	2 N150					*		
C34	.0022 500V		P688N-0022	D6-222	CUB6D22	6DP-1-222	GEM-6222	6TM-D22
C35	.022 250V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C36	.0022 500V		P688N-0022	DD-222	CUB6D22	6DP-1-222	GEM-6222	6TM-D22
C37	.0082			DD-822	HVE16D8	CCD-822	B-282	BL-D80
C38	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C39	.0047		SI 4700	D6-472	BYA10D47M	CCD-472	B-247	5HK-D47
C40	100		SI 100	D6-101	L10T1	CCD-101	GP310	10TS-T10
C41	.015 250V		P488N-015	DD-153	CUB6S15	4DP-1-153	GEM-4115	4TM-S15
C42	.001 10%			DD-102	5R5D1	CCD-102	GP210	10TS-D10
C43	.001 10%			DD-102	5R5D1	CCD-102	GP210	10TS-D10
C44	.0033 500V		P688N-0033	D6-332	CUB6D33	6DP-1-332	GEM-6233	6TM-D33
C45	.001 500V		P688N-001	D6-102	CUB6D1	6DP-1-102	GEM-621	6TM-D10
C46	18		SI 18	D6-180	L10Q18	CCD-180	GP418	10TS-Q18
C47	.033 250V		P488N-033	DD-303	CUB6S33	4DP-2-333	GEM-4133	4TM-S33
C48	.0033 500V		P688N-0033	D6-332	CUB6D33	6DP-1-332	GEM-6233	6TM-D33
C49	.01 250V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C50	.01 250V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C51	.0033 500V		P688N-0033	D6-332	CUB6D33	6DP-1-332	GEM-6233	6TM-D33
C52	470 10%			D6-471	5R5T47	CCD-471	GP347	10TS-T47
C53	330 10%			D6-331	L10T33	CCD-331	GP333	10TS-T33
C54	470 10%			D6-471	5R5T47	CCD-471	GP347	10TS-T47
C55	220 10%			D6-221	L10T22	CCD-221	GP322	10TS-T22
C56	.0012 10%			DD-122	5R5D12	CCD-122	GP212	10TS-D12
C57	.01 250V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C58	.022 250V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C59	.0022 500V		P688N-0022	D6-222	CUB6D22	6DP-1-222	GEM-6222	6TM-D22
C60	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C61	.15 250V		P488N-15		CUB4P15	4DP-4-154	GEM-4015	4TM-P15
C62	.033 250V		P488N-033	DD-303	CUB6S33	4DP-2-333	GEM-4133	6TM-S33
C63	.022 500V		P688N-022	DD-203	CUB6S22	6DP-2-223	GEM-6122	6TM-S22
C64	390 10%			D6-391	L10T39	CCD-391	GP339	10TS-T39
C65	.0015 500V		P688N-0015	D6-152	CUB6D15	6DP-1-152	GEM-6215	6TM-D15
C66	.15 500V		P688N-15		CUB6P15	6DP-5-154	GEM-6015	6TM-P15
C67	470 10%			D6-471	5R5T47	CCD-471	GP347	10TS-T47
C68	330 10%			D6-331	L10T33	CCD-331	GP333	10TS-T33
C69	470 10%			D6-471	5R5T47	CCD-471	GP347	10TS-T47
C70	220 10%			D6-221	L10T22	CCD-221	GP322	10TS-T22
C71	.0012 10%			DD-122	5R5D12	CCD-122	GP212	10TS-D12
C72	.01 250V		P488N-01	D6-103	CUB4S1	4DP-3-104	GEM-411	4TM-S10
C73	.022 250V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C74	390 10%			D6-391	L10T39	CCD-391	GP339	10TS-T39
C75	.022 500V		P688N-022	DD-203	CUB6S22	6DP-2-223	GEM-6122	6TM-S22
C76	.0015 500V		P688N-0015	D6-152	CUB6D15	6DP-1-152	GEM-6215	6TM-D15
C77	.15 500V		P688N-15		CUB6P15	6DP-5-154	GEM-6015	6TM-P15
C78	.0082			DD-822	HVE16D8	CCD-822	B-282	BL-D80
C79	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	Grundig Majestic PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500Ω		7801-284					Balance
B	2.2meg*							Volume, Left Channel
C	2.2meg*							Volume, Right Channel

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS (cont)

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Grundig-Majestic PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R2A	10meg		7806-283					Bass, Right Channel
B	10meg							Bass, Left Channel
C	1000Ω							Bass, Medium Range
D	1000Ω							Treble, Medium Range
E	1meg							Treble, Left Channel
F	1meg							Treble, Right Channel

* Taps ⓖ 330K & 1.5meg.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R3	1000Ω				R43	820K			
R4	33K				R44	150K			
R5	180Ω				R45	180K			
R6	150Ω				R46	220K			
R7	39K 1W				R47	18K			
R8	33K 1W				R48	330K			
R9	1800Ω				R49	22meg			
R10	22K				R50	390Ω			
R11	10Ω				R51	150Ω			
R12	47K				R52	10meg			
R13	100Ω				R53	330K			
R14	10meg 1W				R54	3.3meg			
R15	56K 1W				R55	2.7meg			
R16	1000Ω				R56	47K			
R17	820K				R57	820K			
R18	47K				R58	90Ω 1W			
R19	1000Ω				R59	33K			
R20	68K 1W				R60	10K			
R21	18K				R61	470Ω			
R22	100Ω				R62	1000Ω			
R23	120Ω				R63	150Ω			
R24	6.8meg				R64	1000Ω			
R25	22K				R65	820K			
R26	22K				R66	150K			
R27	330K				R67	180K			
R28	68K				R68	220K			
R29	27K				R69	18K			
R30	1meg				R70	22meg			
R31	1meg				R71	330K			
R32	2.2meg				R72	150Ω			
R33	5.6meg				R73	47K			
R34	330K				R74	820K			
R35	12K				R75	10K			
R36	12K				R76	33K			
R37	2.2meg				R77	22K			
R38	2.2meg				R78	1000Ω 3W			
R39	220K				R79	1.8meg			
R40	220K				R80	470K			
R41	220K				R81	470K			
R42	220K				R82	820K			
					R83	680K			

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		Grundig Majestic PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	Ant. Matching	9238-066					
L2	RF Choke	BV1976					
L3	SW Ant.	9232-001					

COILS (RF-IF) (cont)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		Grundig Majestic PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L4	Loopstick	9233-053					
L5	460KC IF Trap	9208-005					
L6	BC Ant.	9208-059					
L7	LW Ant.	9208-060					
L8	SW Osc.	9232-010					
L9	BC Osc.	9208-013					
L10	LW Osc.	9208-056					
L11A	2nd FM IF	7207-351					
B	1st AM IF						
L12A	3rd FM IF	7207-344					
B	2nd AM IF						
L13A	Ratio Detector	7207-349					
B	3rd AM IF						
L14	RF Choke	BV1976					
L15	Tone Choke	9227-060					
L16	Tone Choke	9227-055					
L17	Tone Choke	9238-060					
L18	Tone Choke	9238-060					
L19	Tone Choke	BV1680					
L20	Tone Choke	BV1680					
L21	Tone Choke	9238-060					
L22	Tone Choke	9238-060					

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	Grundig Majestic PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	220V Tap ⓖ 117V ⓖ .75A	220V ⓖ .230A AC	6.3V ⓖ 4.6A Tap ⓖ 5V ⓖ .5A	9096-039					
	SEC. 3	SEC. 4	SEC. 5						
	6.3VCT ⓖ .3A								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	Grundig Majestic PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	4400Ω CT	1-2Ω CT	9060-080					
		SEC. 2						
		3Ω						
		SEC. 1						
T3	2000Ω	1-2Ω CT	9048-044					
		SEC. 1						
T4	2000Ω	1-2Ω	9048-045					
		SEC. 2						
		40Ω						

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Grundig Majestic PART No.	QUAM PART No.	
SP1	8"x 12"	PM	1-2Ω	7046-001		
SP2	5"x 7"	PM	1-2Ω	0459-000	57A15	
SP3	5"x 7"	PM	1-2Ω	0459-000	57A15	
SP4	5"	PM	3-4Ω	7010-001	5A07	

PARTS LIST AND DESCRIPTIONS (Continued)

POWER RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA			NOTES
	CURRENT (Measured)	Grundig Majestic PART No.	RCA PART No.	SARKES TARZIAN PART No.	
M1	.120A	*	1N1763 †	F61 †	* Bridge Type Selenium † Silicon Type, 4 Required

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA						NOTES
			Grundig Majestic PART No.		LITTELFUSE PART No.		BUSS PART No.		
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER	
M2		1A ① 125V ½A ② 250V			213001 (1A 125V)		GMA 1		

① Used when AC input voltage is 120VAC.
② Used when AC input voltage is 220VAC.

MISCELLANEOUS

ITEM No.	PART NAME	Grundig Majestic PART No.	NOTES
M3	FM Tuner		Complete (Includes Tuning Gang Part #9653-606)
M4	Tuning Cap.	9653-012	2 Gang
M5	Switch		Function Selector, Pushbutton Type
M6	Switch		Tone Selector, Pushbutton Type

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

DIAL CORD STRINGING

PHOTOFACT® Folder with CIRCUITRACE®

HEATH
MODEL GWW-30

HEATH
MODEL GWW-30

HEATH
MODEL GWW-30

TRADE NAME	Heath Model GWW-30
MANUFACTURER	Heath Co., A Subsidiary of Daystrom, Inc., Benton Harbor, Michigan
TYPE SET	Battery Operated Transistorized Portable Citizens Band Transmitter-Receiver
POWER SUPPLY	9 Volts DC RATING 12MA@9 Volts DC (Receive) 25MA@9 Volts DC (Transmit)
TUNING RANGE	Any One of Citizens Band Channels 1 thru 23

NOTICE

ONLY THOSE PERSONS PROPERLY LICENSED ARE PERMITTED TO MAKE REPAIRS OR ADJUSTMENTS WHICH MAY RESULT IN ILLEGAL OPERATION. (REFER TO FCC RULES & REGULATIONS PART 19, SUBPART D, SECTION 19.71).

SET 556 FOLDER 10

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of KZ806

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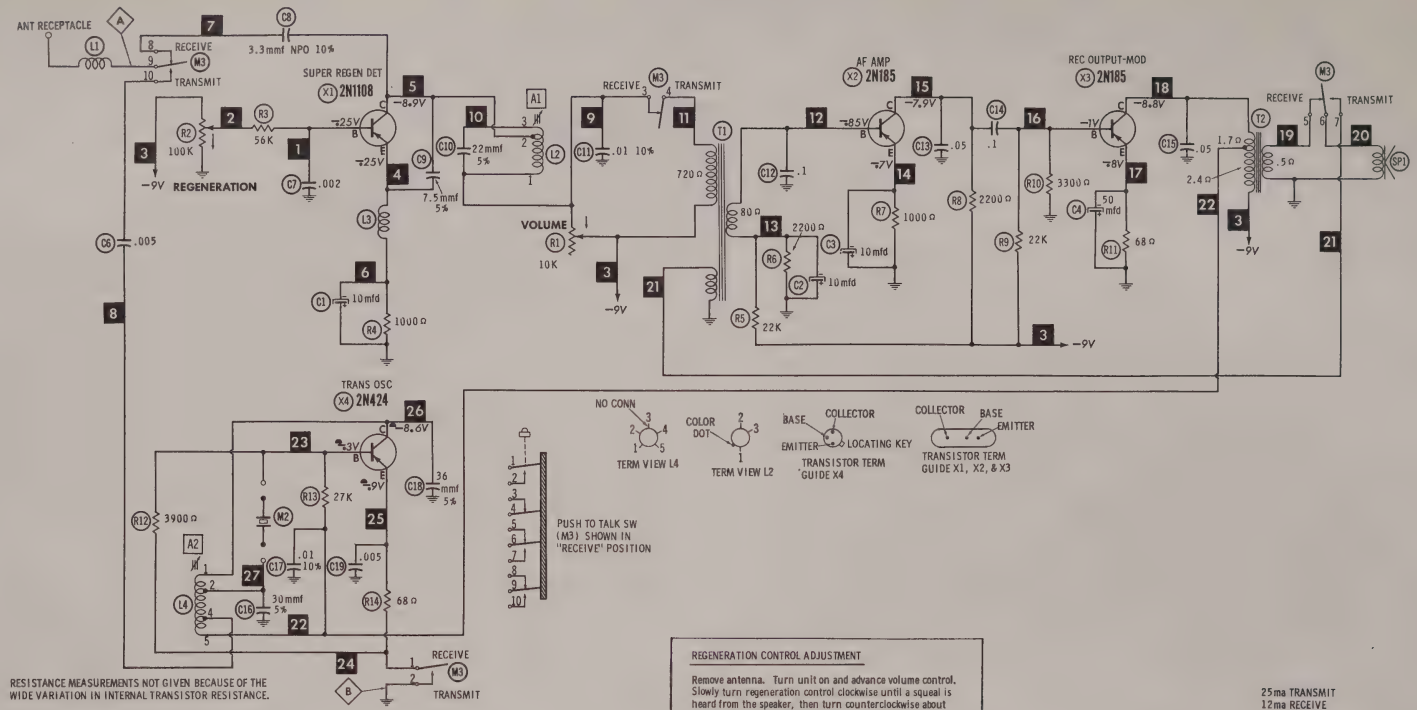

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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REGENERATION CONTROL ADJUSTMENT

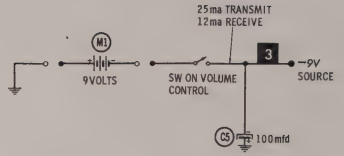
Remove antenna. Turn unit on and advance volume control. Slowly turn regeneration control clockwise until a squeal is heard from the speaker, then turn counterclockwise about 1/4 turn until squeal is no longer heard. Depress and release transmit button. A hiss should be heard. If not, slowly turn regeneration control clockwise until a hiss is heard each time the transmit button is released.

RECEIVER ALIGNMENT

Insert antenna. Adjust A1 for best reception from a transmitter placed far enough away to produce a weak signal.

TRANSMITTER ALIGNMENT

Remove antenna and connect a lamp bulb from point A to point B. Depress transmit button and adjust A2 for maximum bulb brilliance. The bulb should glow each time the button is depressed. If not, adjust A2 slowly clockwise until the bulb does glow each time.
NOTE: The glow of the bulb will be dim because of the low RF output.



HEATH
MODEL GWW-30

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA		NOTES
			RCA PART No.	RAYTHEON PART No.	
X1	2N1108	Superregen. Det.	2N412		PNP
X2	2N185	AF Amplifier	2N408	2N633	PNP
X3	2N185	Rec. Output-Mod.	2N408	2N633	PNP
X4	2N424	Trans. Osc.			PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	HEATH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1	10	10	25-54	PTT39	NLW10-15	MT1-5	TT12X10	MLV10-10	TE-1114
C2	10	10	25-54	PTT39	NLW10-15	MT1-5	TT12X10	MLV10-10	TE-1114
C3	10	10	25-54	PTT39	NLW10-15	MT1-5	TT12X10	MLV10-10	TE-1114
C4	50	10	25-55	PTT45	NLW50-10	MT1-16	TT10X50	MLV50-10	TE-1119
C5	100	10	25-56	PTT46	NLW100-12	MT1-19	TT15X100	MLV100-10	TE-1119.3

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C6	.005		DI-5000	DM-502	H-05S5	CCD-502	TA-250	TG-D50
C7	.002		DI-2000	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C8	3.3 NPO 10%		NPO-DI 3.3	DTZ-3R3	C10V33C	CCTO-3R3	CNO-533	10TCC-V33
C9	7.5 5%							
C10	22 5%		1469-000022	TCZ-22	22R5Q22	CM-19B-220J		MS-422
C11	.01 10%		DI-10000			CCD-103		10TS-S10
C12	.1		C80V104AM	DA-104	H-05P1		TA-010	TG-P10
C13	.05		BPD-05	DD-503	H-05S5		TA-150	TG-S50
C14	.1		C80V104AM	DA-104	H-05P1		TA-010	TG-P10
C15	.05		BPD-05	DA-503	H-05S5		TA-150	TG-S50
C16	30 5%		1469-00003	TCZ-30	22R5Q3	CM-19B-300J		MS-43
C17	.01 10%		DI-10000			CCD-103		10TS-S10
C18	36 5%		1469-000036	TCZ-36	22R5Q36	CM-19B-360J		MS-436
C19	.005		BPD-005	DM-502	H-05D5	CCD-502	TA-250	TG-D50

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	HEATH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	10K	1/4	19-54		44S-10K-W		MLC14A-S	Volume & Switch
R2	100K	1/4	10-109					Regeneration

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R3	56K				R9	22K			
R4	1000Ω				R10	3300Ω			
R5	22K				R11	68Ω			
R6	2200Ω				R12	3900Ω			
R7	1000Ω				R13	27K			
R8	2200Ω				R14	68Ω			

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		HEATH PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	Ant. Loading(2.2uh)	40-319	BC-563	4606	RTC-8517	T857	
L2	Rec. Osc.	40-317					
L3	RF Choke(15uh)	45-51	BC-566	4624	RTC-8524	T862	
L4	Transmitt Osc.	40-318					

PRINTED BOARD

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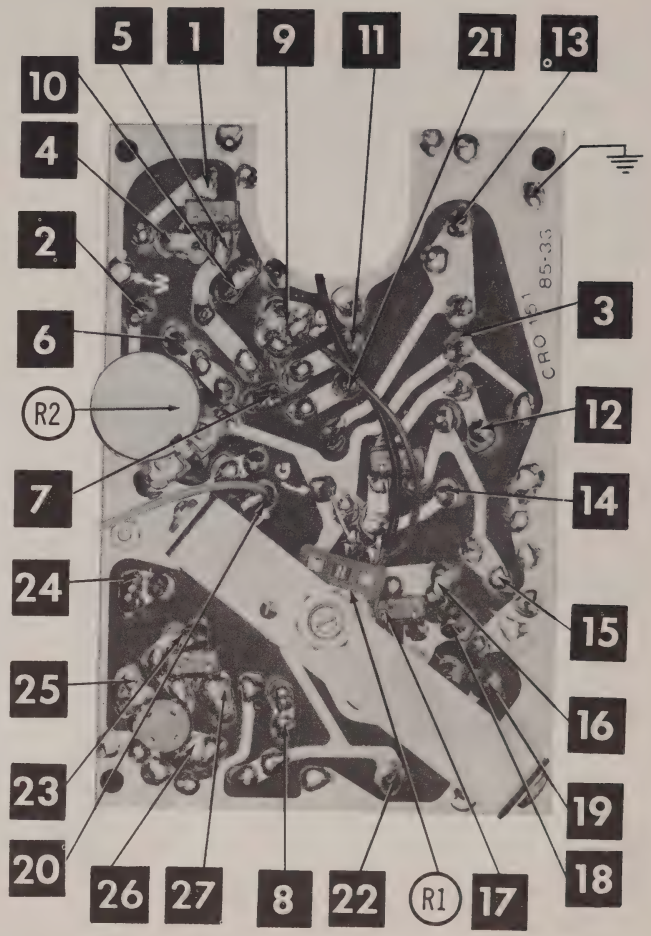


PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO PRI.	TURNS RATIO SEC.	REPLACEMENT DATA HEATH PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	3.5	:1 SEC. 1	51-66					
	40	:1 SEC. 2						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA HEATH PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	650Ω Tap @ 600Ω	3-4Ω	51-67					

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA HEATH PART No.	QUAM PART No.	NOTES
SP1	3"	PM	3-4Ω	401-37		

BATTERIES

ITEM No.	VOLTAGE	HEATH PART No.	REPLACEMENT DATA BURGESS "A"	BURGESS "B"	EVEREADY "A"	EVEREADY "B"	MALLORY "A"	MALLORY "B"	NOTES
M1	9V			2N6		246		M-1602	

MISCELLANEOUS

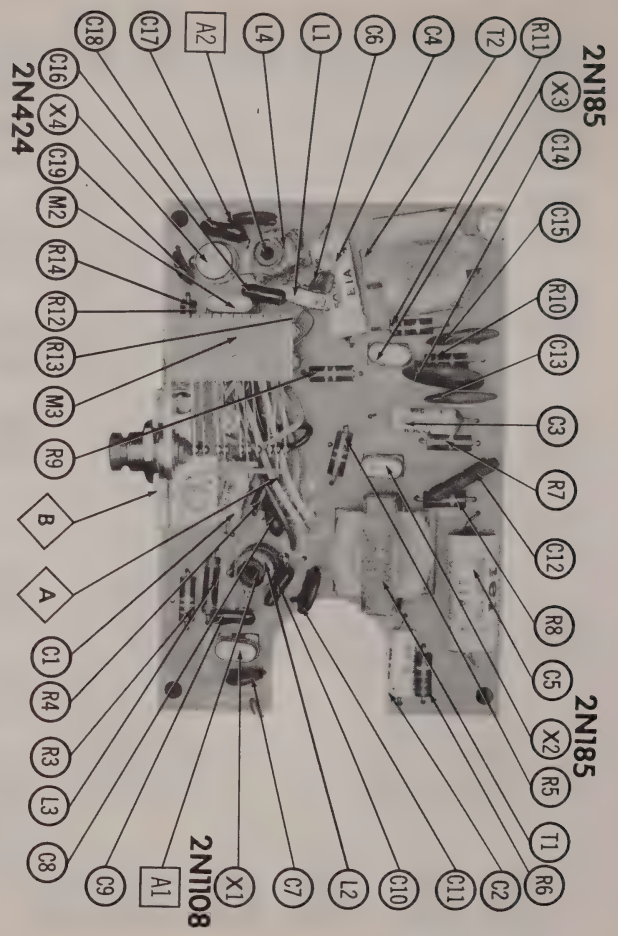
ITEM No.	PART NAME	HEATH PART No.	NOTES
M2	Crystal, Transmit	404-67	26.965MC Channel 1
		404-68	26.975MC Channel 2
		404-69	26.985MC Channel 3
		404-70	27.005MC Channel 4
		404-71	27.015MC Channel 5
		404-72	27.025MC Channel 6
		404-73	27.035MC Channel 7
		404-74	27.055MC Channel 8
		404-75	27.065MC Channel 9
		404-76	27.075MC Channel 10
		404-77	27.085MC Channel 11
		404-78	27.105MC Channel 12
		404-79	27.115MC Channel 13
		404-80	27.125MC Channel 14
		404-81	27.135MC Channel 15
		404-82	27.155MC Channel 16
		404-83	27.165MC Channel 17
		404-84	27.175MC Channel 18
		404-85	27.185MC Channel 19
		404-86	27.205MC Channel 20
		404-87	27.215MC Channel 21
		404-88	27.225MC Channel 22
		404-89	27.255MC Channel 23
M3	Switch	64-10	Push to talk (4 Section Pushbutton Type)
M4	Antenna	142-35	40" Whip, Collapsible to 7 1/2"
	Printed Board	85-33F373	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	462-109	
Leather Case	93-4	Includes Strap

CHASSIS—TOP VIEW



WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors

PHOTOFACT® Folder with CIRCUITRACE®

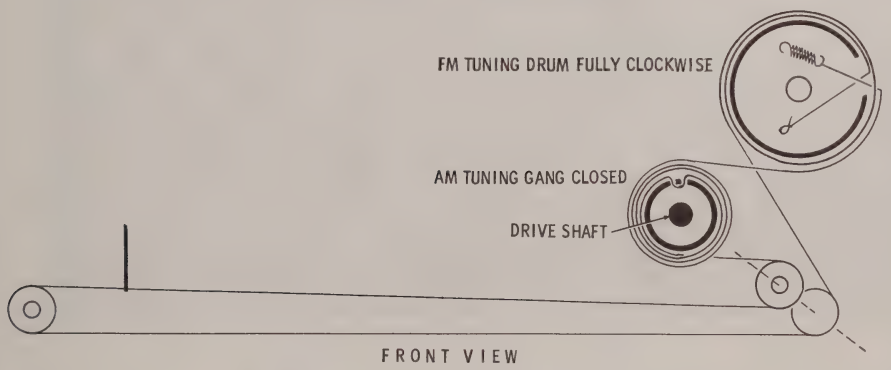
KORTING
MODEL BILLY 1036

KORTING
MODEL BILLY 1036

KORTING
MODEL BILLY 1036

TRADE NAME	Korting Model Billy 1036		
IMPORTER	Delmonico International, Div. of Thompson-Starrett Co., Inc., 120-20 Roosevelt Ave., Corona 68, N. Y.		
TYPE SET	AC Operated 5 Tube FM-BC-SW Receiver		
POWER SUPPLY	110 – 120 Volts AC, 60 Cycles	RATING	35 Watts, .33 Amp. @117 Volts AC
TUNING RANGE—BROADCAST	510 – 1620KC	FREQ. MOD.	88 – 108MC
		SHORT WAVE	5.85-19MC

DIAL CORD STRINGING



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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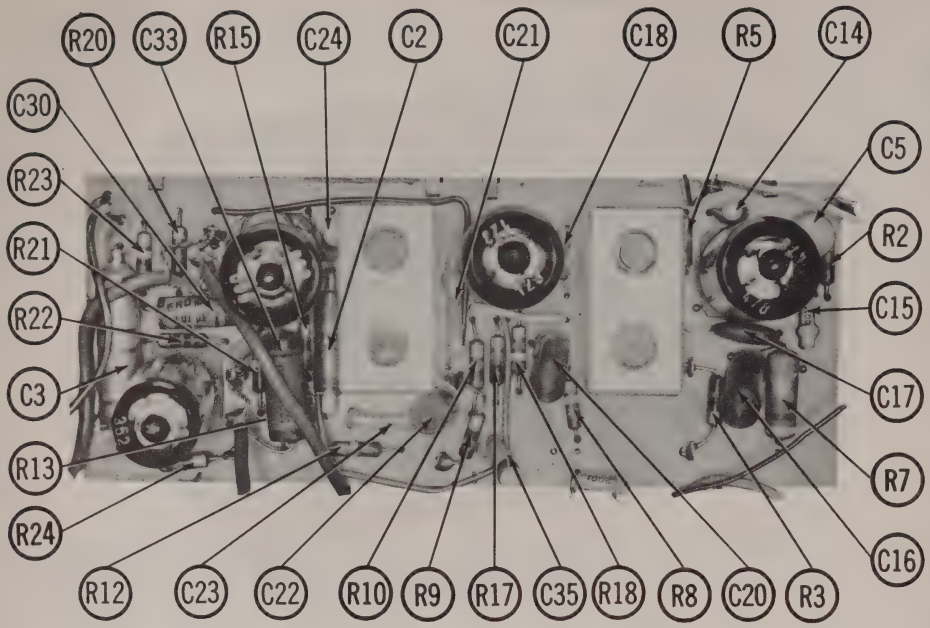
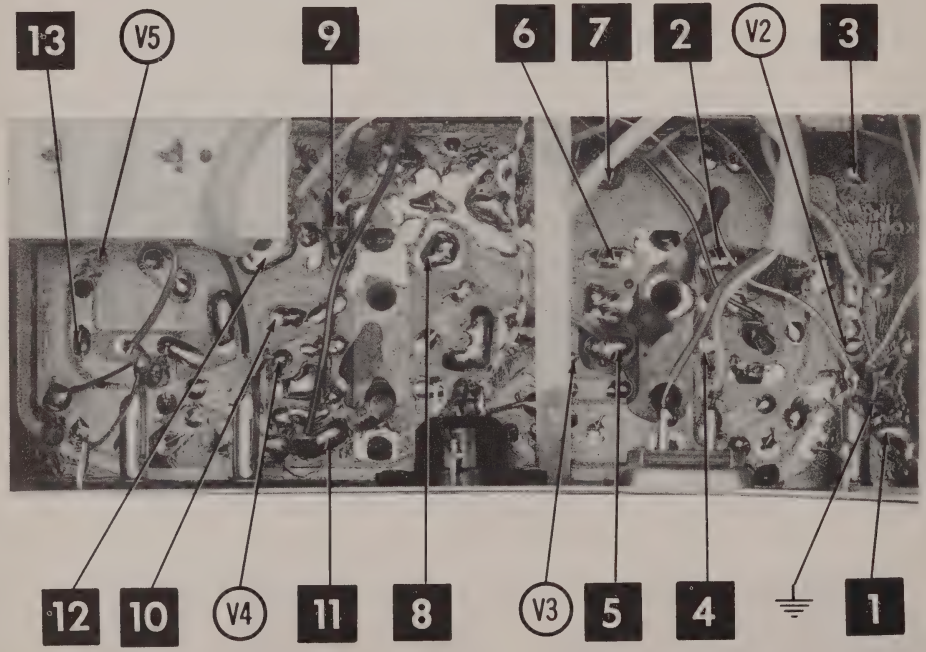
SET 556 FOLDER 11



PRINTED BOARD-TOP VIEW



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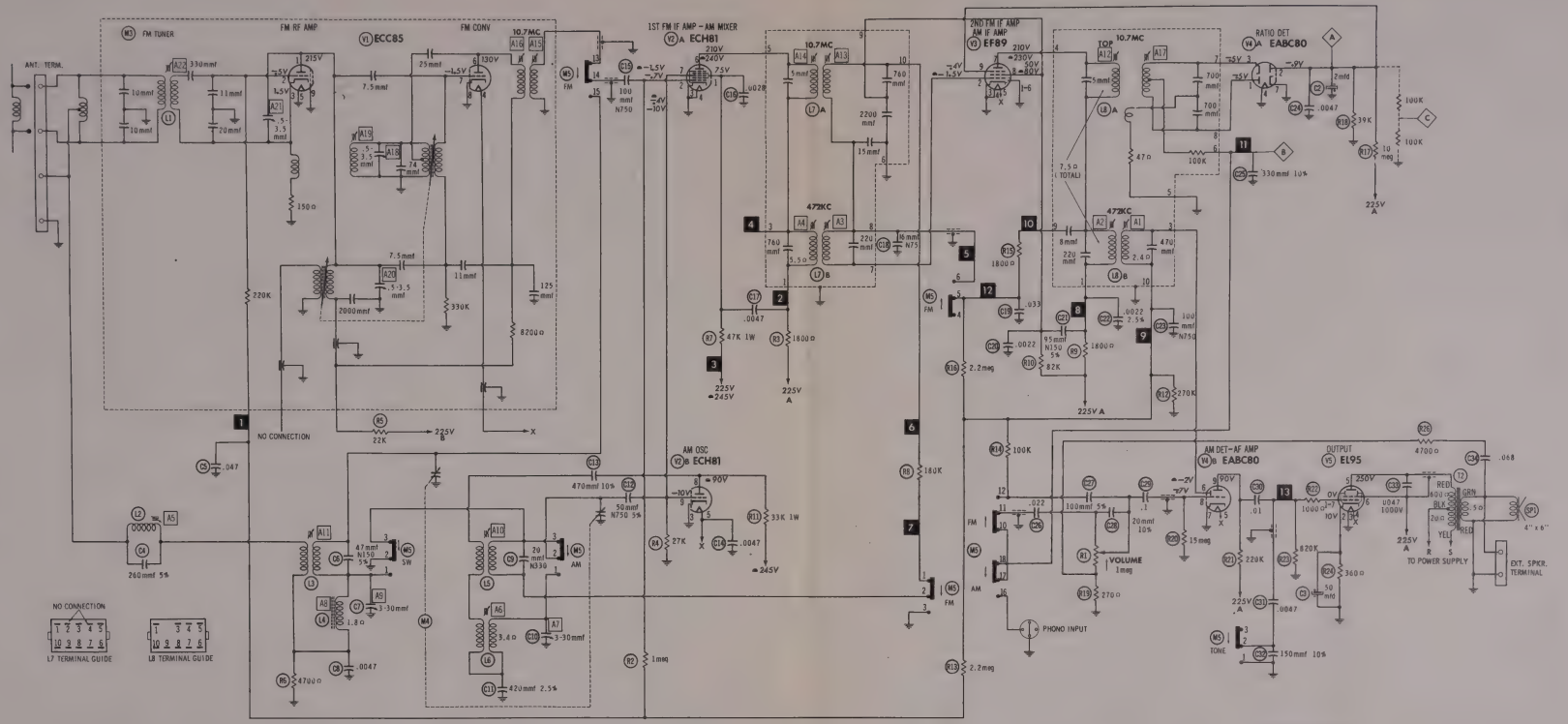
PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC85	†22K	2.7meg	150Ω	FIL	FIL	†30K	330K	0Ω	0Ω
V2	ECH81	†48K	3.5meg	0Ω	FIL	FIL	†2800Ω	27K	+134K	-27K
V3	EF89	0Ω	180K ±2.5meg	0Ω	FIL	FIL	0Ω	†2800Ω	†83K	39K
V4	EABC80	INF	39K	INF	FIL	FIL	-270K	0Ω	15meg	†220K
V5	EL95	NC	360Ω	FIL	FIL	†600Ω	†1000Ω	820K		

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
• MEASURED IN "AM" POSITION.
† MEASURED FROM OUTPUT OF M1. NC NO CONNECTION

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±5% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CircuiTracer

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KORTING MODEL BILLY 1036

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use only enough generator output to provide a usable indication

Suggested Alignment Tools: A6, All..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532
A7, A9, A18, A20, A21..GENERAL CEMENT #5000, 5003, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537

AM ALIGNMENT — SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .005mfd to pin 2 (grid) to FM Mixer. Low side to chassis.	472KC (400~ 30% AM)	(AM) Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	High side thru .005mfd to AM antenna terminal. Low side to chassis.	"	"	"	A5	Adjust for MINIMUM output.
3.	"	520KC	520KC	"	A6	Adjust for maximum output.
4.	"	1600KC	1600KC	"	A7	"
5.	"	560KC	560KC	"	A8	Adjust by moving coil along ferrite core for maximum output.
6.	"	1600KC	1600KC	"	A9	Adjust for maximum output.
7.	"	6MC	(SW) 6MC	"	A10	"
8.	"	7MC	7MC	"	A11	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM—SELECTOR IN FM POSITION

Connect two matched 100K (±1%) resistors in series from point Ⓐ to chassis. The junction of these two resistors is alignment point Ⓒ as shown on the schematic.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
9.	High side to an ungrounded tube shield over FM Converter. Low side to chassis.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe to point Ⓐ. Common to chassis.	A12, A13, A14, A15, A16	Adjust for maximum deflection.
10.	"	"	"	DC probe to point Ⓑ. Common to point Ⓒ.	A17	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE—SELECTOR IN FM POSITION

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
9.	High side to an ungrounded tube shield over FM Converter. Low side to chassis.	10.7MC (450KC Swp.)	(FM) Point of non-interference.	Vert. amp. to point Ⓐ. Low side to chassis.	A12, A13, A14, A15, A16	Disconnect stabilizing Capacitor C2. Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Reconnect C2.
10.	"	"	"	Vert. amp. to point Ⓑ. Low side to chassis.	A17	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A12 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT — SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
11.	Across FM antenna terminals with 120Ω in each lead.	105MC (Unmod.)	(FM) 105MC	DC probe to point Ⓐ. Common to chassis.	A18	Adjust for maximum deflection.
12.	"	89MC	89MC	"	A19	"
13.	"	100MC	100MC	"	A20	"
14.	"	"	"	"	A21	Adjust for MINIMUM deflection.
15.	"	"	"	"	A22	Adjust for maximum deflection.

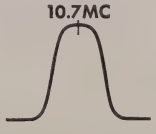


FIG. 1

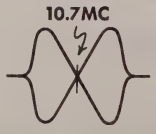
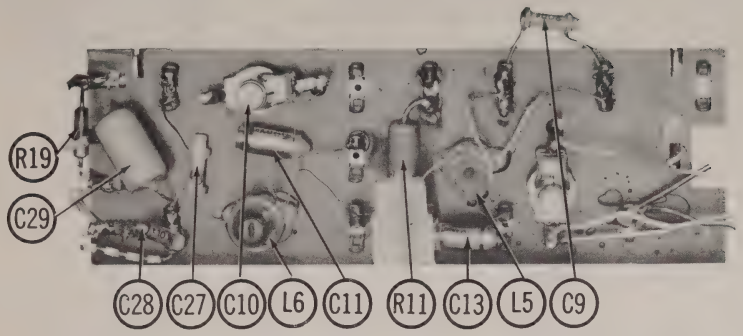
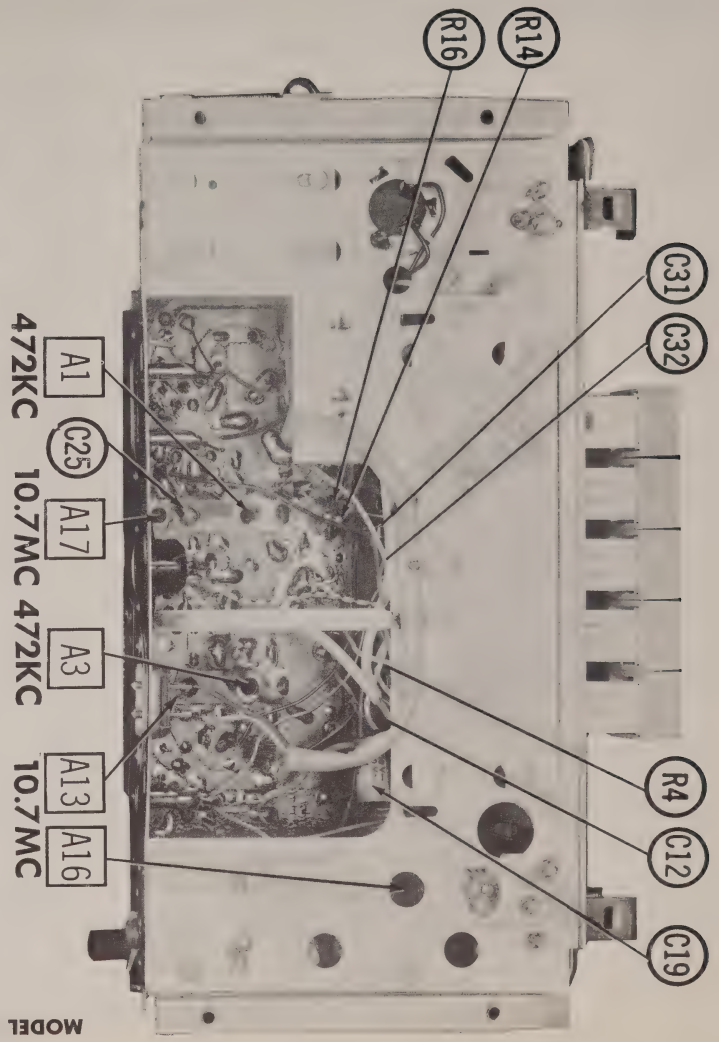


FIG. 2

OSC. TONE CHASSIS—TOP VIEW



CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (GENERAL ELECTRIC • RAYTHEON • SYLVANIA)
V1	FM RF Amp. -FM Conv.	ECC85
V2	1st FM IF Amp. -AM Mixer-AM Osc.	ECH81
V3	2nd FM IF Amp-AM IF Amp.	EF89
V4	Ratio Det. -AM Det. -AF Amplifier	EABC80
V5	Output	EL95

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA KORTING PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1A	50	350		PRS1680					
B	50	350		PRS1680					
C2	2	70		PRS1705	NLW2-100	MT1-2	TT150X2	MLV2-100	TE-1401
C3	50	30		PTT98	NLW50-50	MT1-17	PET1980	MLV50-50	TE-1307

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	260 5%			TCZ-270	5R5T27	CM-19B-27LJ		10TCC-T27
C5	.047 250V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C6	47 N150 5%					*		10TCP-Q47
C7	3-30							
C8	.0047 500V		P688N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C9	20 N330					*		10TCS-Q22
C10	3-30							
C11	420 2.5%					CM-15E-431G		
C12	50 N750 5%			TCZ-50	C10Q5U			
C13	470 10%			D6-471	5R5T47	CCD-471	GP347	10TS-T47
C14	.0047		SI 4700	D6-472	BYA10D47M	CCD-472	B-247	5HK-D47

PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C15	100 N750		N750-SI 100	TCN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C16	.0028		SI 2700	D6-272	BYA10D27	CCD-272	B-227	10TS-D27
C17	.0047		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C18	16 N75				*	*		
C19	.033 250V		P488N-033	DD-203	CUB6S33	4DP-2-333	GEM-4133	6TM-S33
C20	.0022		SI 2200	D6-222	BYA10D22	CCD-222	B-222	5HK-D22
C21	95 N150 5%					*		
C22	.0022 2.5%					CM-20E-222G	MCE459	
C23	100 N750		N750-SI 100	TCN-100	C10T1U	CCTN-100	CN7-310	10TCU-T10
C24	.0047		SI 4700	D6-472	BYA10D47M	CCD-472	B-247	5HK-D47
C25	330 10%			D6-330	L10T33	CCD-331	GP333	10TS-T33
C26	.022 250V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	6TM-S33
C27	100 5%		NPO-SI 100	TCZ-101	C10T1C	CCTO-101	CNO-310	10TCC-T10
C28	20 10%		NPO-SI 20	D6-200	L10Q2	CCD-200	GP420	10TS-Q20
C29	.1 125V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C30	.01 250V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C31	.0047 500V		P688N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C32	150 10%		NPO-SI 150	D6-151	L10T15	CCD-151	GP315	10TS-T15
C33	.0047 1000V		P1088N-0047	DD-472	CUB10S47	10DP-2-472	GEM-10247	10TS-D47
C34	.068 250V		P488N-068		CUB6S68	4DP-3-683	GEM-4168	4TM-S68
C35	.0047		SI 4700	D6-472	BYA10D47M	CCD-472	B-247	5HK-D47
C36A	.005 500V		P688N-005	D6-502	CUB6D5	6DP-1-502	GEM-625	6TM-D50
B	.005 500V		P688N-005	D6-502	CUB6D5	6DP-1-502	GEM-625	6TM-D50

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	KORTING PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	1meg	½						Volume

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS
R2	1meg			
R3	1800Ω			
R4	27K			
R5	22K			
R6	4700Ω			
R7	47K 1W			
R8	180K			
R9	1800Ω			
R10	82K			
R11	33K 1W			
R12	270K			
R13	2.2meg			
R14	100K			

ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS
R15	1800Ω			
R16	2.2meg			
R17	10meg			
R18	39K			
R19	270Ω			
R20	15meg			
R21	220K			
R22	1000Ω			
R23	820K			
R24	360Ω			
R25	1000Ω 1W			
R26	4700Ω			

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		KORTING PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	Ant. Matching	BV652					
L2	472KC IF Trap	BV881					
L3	SW Ant.	BV882					
L4	Loopstick	BV884	BC-419	705-A		7532	
L5	SW Osc.	BV883					
L6	BC Osc.	BV657					
L7A	2nd FM IF	BV835					
B	1st AM IF						

COILS (RF-IF) (cont)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		KORTING PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L8A	Ratio Detector	BV836					
B	2nd AM IF						

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	KORTING PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	117V ① .33A	200V ② .110A	6.3V ③ 2.4A	BV1134					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	KORTING PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	8700Ω Tap ② 3%	3-4Ω	BV1119					

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	KORTING PART No.	QUAM PART No.	
SP1	3 3/4"x	6" PM	3-4Ω	P915 19/80		

POWER RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA			NOTES
	CURRENT (Measured)	KORTING PART No.	RCA PART No.	SARKES TARZIAN PART No.	
M1	.050A	B250 C75*			* Bridge Type Selenium

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			KORTING PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG	3/8A 250V			313.375 (3AG 3/8A 250V)	342001	MDL 3/8	HKP

MISCELLANEOUS

ITEM No.	PART NAME	KORTING PART No.	NOTES
M3	FM Tuner		Complete
M4	Tuning Cap.		2 Gang
M5	Switch		Function Selector, Pushbutton Type

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT® Folder

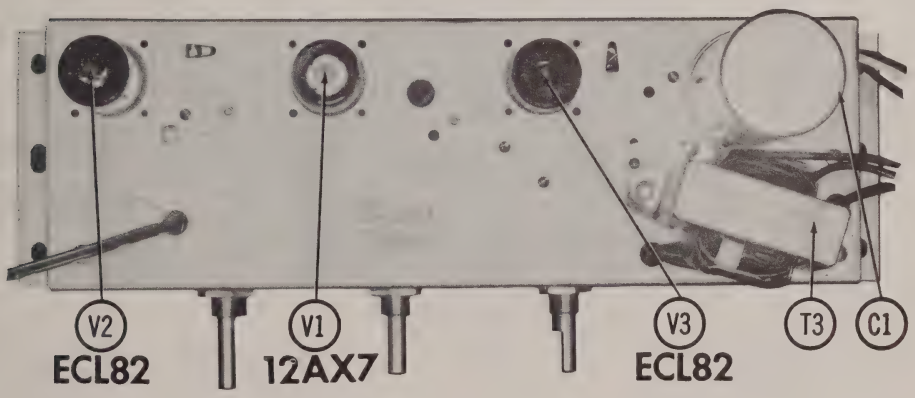
MOTOROLA MODELS SK34 SERIES (Ch. HS-889A, HS-890A, HS-893A)

MOTOROLA MODELS SK34 SERIES (Ch. HS-889A, HS-890A, HS-893A)

TRADE NAME	Motorola Models SK34B, SK34B-1, SK34CD-1, SK34CW, SK34CW-1, SK34M, SK34M-1, SK34W, SK34W-1 (Amp. Ch. HS-890A, Power Ch. HS-889A or HS-893A)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois
TYPE SET	AC Operated 4 Tube Stereo Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110 – 120 Volts AC, 60 Cycles RATING 42 Watts, .42 Amp. @ 117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER BRI3RC USED IN MODEL SK34 SERIES – SEE SIMILAR B.S.R. UA8– PHOTOFACT SET 381 FOLDER 11 OR RECORD CHANGER MANUAL RC-11

FOR SERVICE INFORMATION ON RECORD CHANGER VM41RC USED IN MODEL SK34-1 SERIES – SEE SIMILAR V-M 1571– PHOTOFACT SET 527 FOLDER 14



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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SET 556 FOLDER 12

PARTS LIST AND DESCRIPTIONS

TUBES

◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Left Channel AF Amp. - Right Channel AF Amp.	12AX7	V3	Right Channel AF Amp. - Right Channel Output	ECL82/6BM8
V2	Left Channel AF Amp. - Left Channel Output	ECL82/6BM8	V4	Rectifier	EZ80/6V4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1A	▲50	250	23K645880	AFH4-02-45	D0870	XC4-22	FP425.1	TMQ-4322	TVL-4660
B	▲80	250							
C	▲10	250							
D	20	250							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	470 10%		DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C3	100 N750 10%		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C4	.0033 10%		DI-3300		PM6D33	CCD-332	JL-233	10TS-D33
C5	.02 400V		P488N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	4TM-S20
C6	470 10%		DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C7	.005 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C8	.005 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C9	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C10	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C11	470 10%		DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C12	100 N750 10%		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C13	.0033 10%		DI-3300		PM6D33	CCD-332	JL-233	10TS-D33
C14	.02 400V		P488N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	4TM-S20
C15	470 10%		DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C16	.005 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C17	.005 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C18	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C19	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	2meg 600K Tap	½	18D60116A03	BT-174 *			FB26T75	Loudness, Left Channel
B	2meg 600K Tap	½		SR-174 *			RU26T75	Loudness, Right Channel
C	Shaft			Not Req.			CS3500	
R2A	1meg	⅓	18D60116A05	B-68			FA16R	Tone, Right Channel
B	1meg	⅓		SR-68			RU16R	Tone, Left Channel
C	Shaft			Not Req.			CS3500	
R3A	700K †	½	18D60116A02					Balance
B	Switch							Push-Pull -Stereo-Monaural

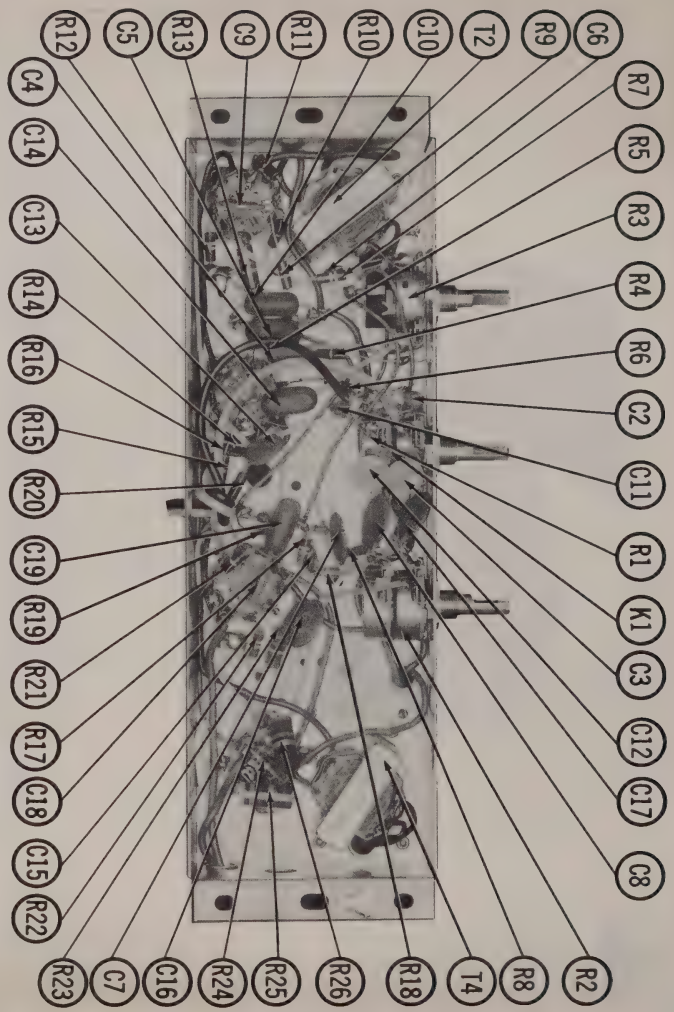
* Do not use Tap #1.
† Taps @ 105K & 595K.
Stops @ 105K & 595K.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R4	2.2meg				R9	220K			
R5	100K				R10	2200Ω			
R6	680Ω				R11	1meg			
R7	220K				R12	820K			
R8	33K				R13	270Ω 1W			

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS
R14	2.2meg			
R15	100K			
R16	680Ω			
R17	220K			
R18	33K			
R19	220K			
R20	2200Ω			

ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS
R21	1meg			
R22	820K			
R23	270Ω			
R24	6800Ω			
R25	4700Ω 2W			
R26	120Ω 2W			

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	MOTOROLA PART No.	REPLACEMENT DATA
K1	Loudness Comp.	(2) .005mfd, (2) 68K	51B644164	

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	MOTOROLA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	117V@ .42A	380VCT @ .070A DC	6.3V@ .6A	25C60436A01 ①				R-22B②	① Part #25C645884 used in Chassis HS-889. ② Drill new mounting hole.
	SEC. 3	SEC. 4	SEC. 5						
	6.3V@ 1.8A								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	MOTOROLA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	4000Ω	6-8Ω	25B60373A01-A ①	A-2900	A-3856	24S04	S-62X	① Alternate Part #25B60373A01
T3	8500Ω CT	6-8Ω	25B60391A02-C ②	A-2901	A-3823	24S06	S-53X	② Alternate Part #25B60391A02
T4	4000Ω	6-8Ω	25B60373A01-A ①	A-2900	A-3856	24S04	S-62X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	
SP1	6"	PM	6-8Ω	50D60475A01	6A15Z8	
SP2	10"	PM	6-8Ω	50D60179A02	10A6PA	
SP3	6"	PM	6-8Ω	50D60475A01	6A15Z8	

PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

ITEM No.	REPLACEMENT DATA								NOTES
	MOTOROLA PART No.		ASTATIC PART No.		ELECTRO-VOICE PART No.		SONOTONE PART No.		
	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	
M1	59C60335A01 †	59C60336A04* (LP)	17	Not Req.	26S	Not Req.	8TA4-S	N-8TA-S *	† Includes Needles. ♦ Alternate LP diamond
		59C60336A03* (78RPM)							
		59C60336A05* ♦							

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MOTOROLA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG	1A 125V S/B P/T	65K646113		315001 (3AG 1A 125V) S/B P/T)		MDV 1	

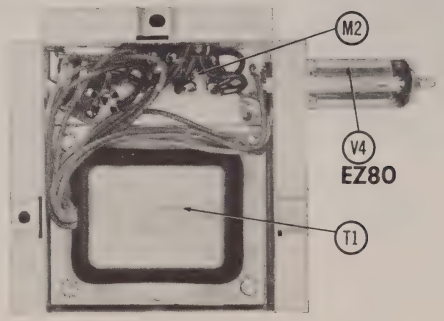
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

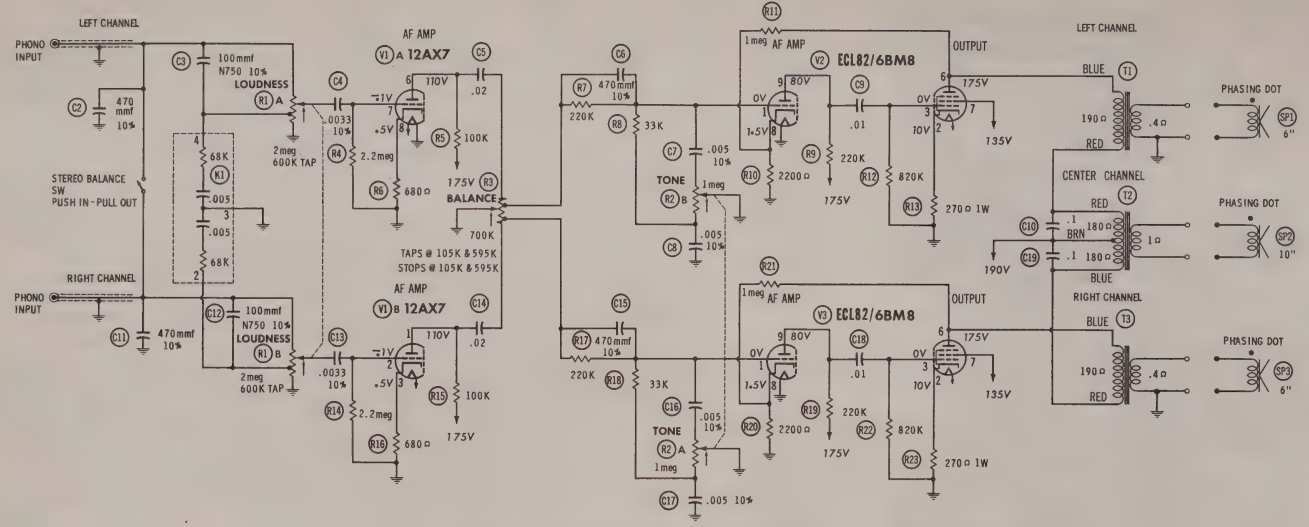
NAME	PART NO.	DESCRIPTION
Knob	36K647181	Loudness, Tone
Knob	36K647182	Balance
Cabinet	16E60445A05	Blond Oak, Model SK34B
Cabinet	16E60445A06	Blond Oak, Model SK34B-1
Cabinet	16E60450A07	Dark Cherrywood, Model SK34CD-1
Cabinet	16E60450A01	Light Cherrywood, Model SK34CW
Cabinet	16E60450A02	Light Cherrywood, Model SK34CW-1
Cabinet	16E60445A01	Mahogany, Model SK34M
Cabinet	16E60445A02	Mahogany, Model SK34M-1
Cabinet	16E60445A03	Walnut, Model SK34W
Cabinet	16E60445A04	Walnut, Model SK34W-1
Cabinet Leg	16E60445A12	Blond Oak, Model SK34B, SK34B-1
Cabinet Leg	16E60450A09	Dark Cherrywood, Model SK34CD-1
Cabinet Leg	16E60450A04	Light Cherrywood, Model SK34CW, SK34CW-1
Cabinet Leg	16E60445A10	Mahogany, Models SK34M, SK34M-1
Cabinet Leg	16E60445A11	Walnut, Models SK34W, SK34W-1
Cabinet Lid	16E60445A09	Blond Oak, Models SK34B, SK34B-1
Cabinet Lid	16E60445A08	Dark Cherrywood, Model SK34CD-1
Cabinet Lid	16E60445A03	Light Cherrywood, Models SK34CW, SK34CW-1
Cabinet Lid	16E60445A07	Mahogany, Models SK34M, SK34M-1
Cabinet Lid	16E60445A08	Walnut, Models SK34W, SK34W-1

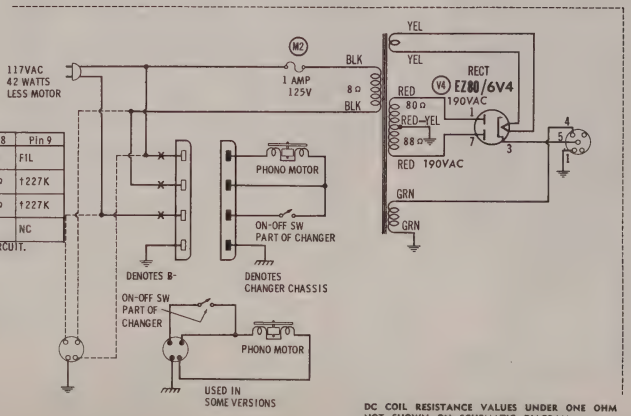
WIRING DATA

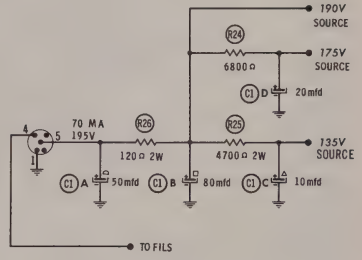
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)



POWER CHASSIS







RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†107K	2.2meg	680Ω	FIL	FIL	†107K	2.2meg	680Ω	FIL
V2	ECC82 6BM8	33K	270Ω	820K	FIL	FIL	†490Ω	†4800Ω	2200Ω	†227K
V3	ECC82 6BM8	33K	270Ω	820K	FIL	FIL	†490Ω	†4800Ω	2200Ω	†227K
V4	EZ80 6V4	80Ω	NC	¶ INF	FIL	FIL	NC	88Ω	NC	NC

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
1 MEASURED FROM PIN 3 OF V4. NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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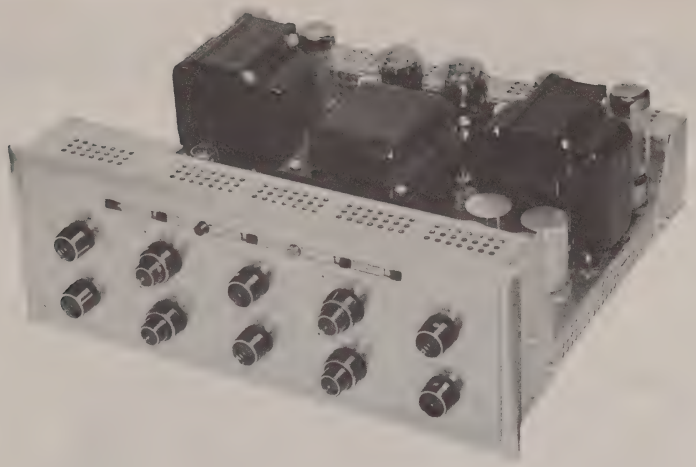
MOTOROLA MODELS SK34 SERIES (Ch. HS-889A, HS-890A, HS-893A)

PHOTOFACT® Folder

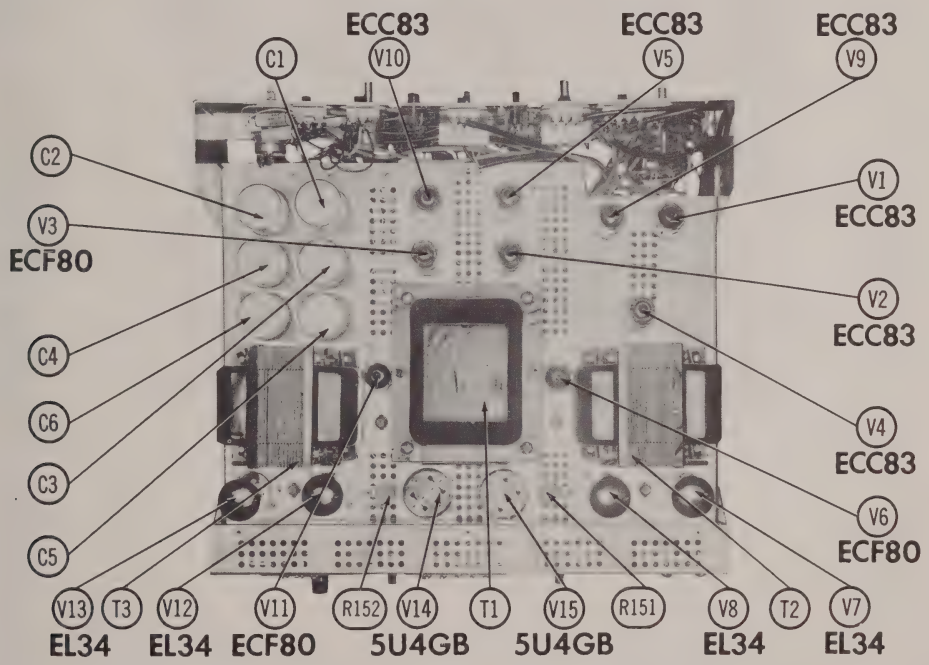
H. H. SCOTT
MODEL 272



H. H. SCOTT
MODEL 272

TRADE NAME	H. H. Scott Model 272
MANUFACTURER	H. H. Scott, Inc., 111 Powder Mill Road, Maynard, Mass.
TYPE SET	AC Operated 15 Tube Stereo Amplifier
POWER SUPPLY	105 – 125 Volts AC, 50-60 Cycles RATING 210 Watts, 1.9 Amp. @117 Volts AC

H. H. SCOTT
MODEL 272



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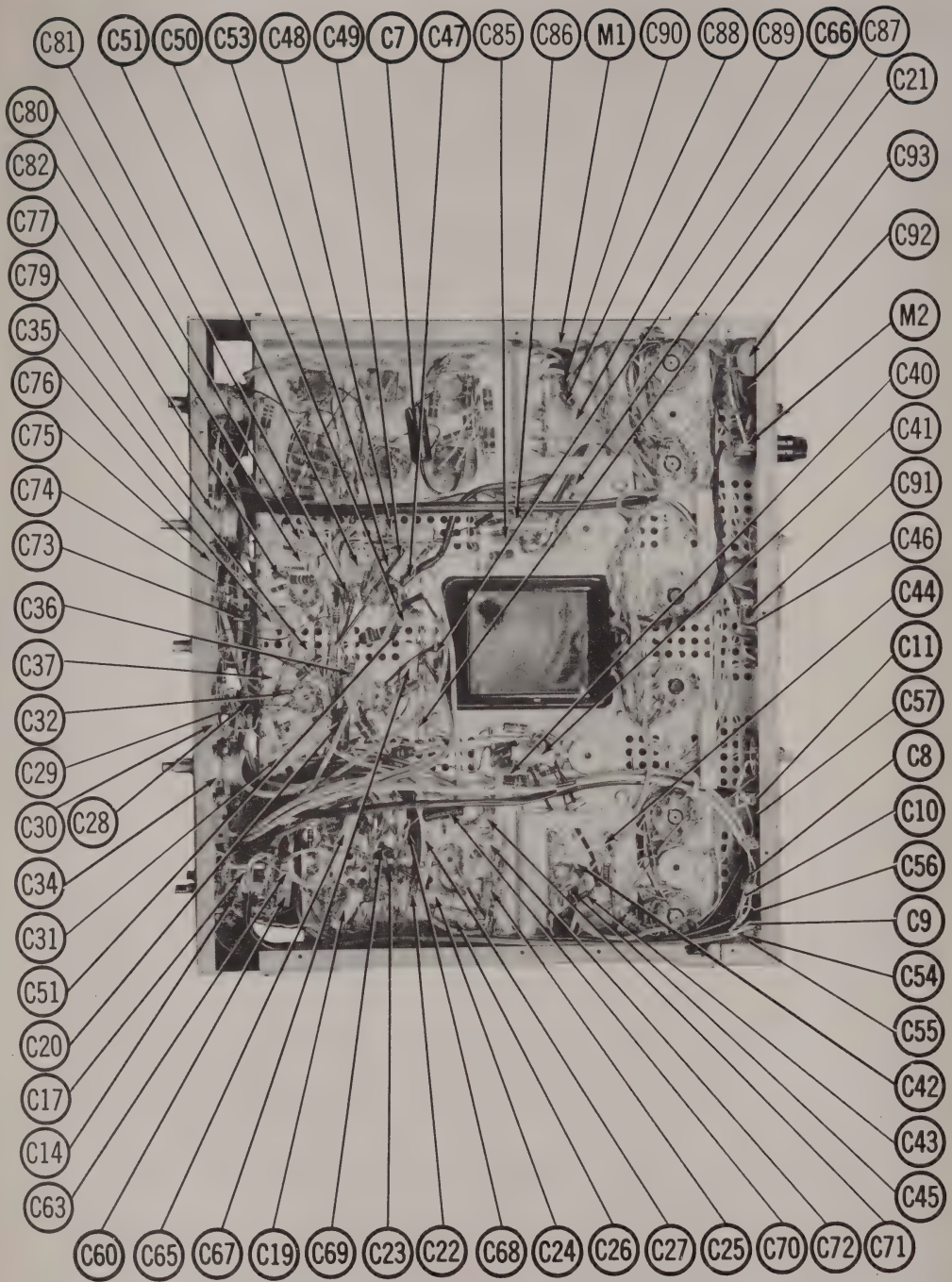
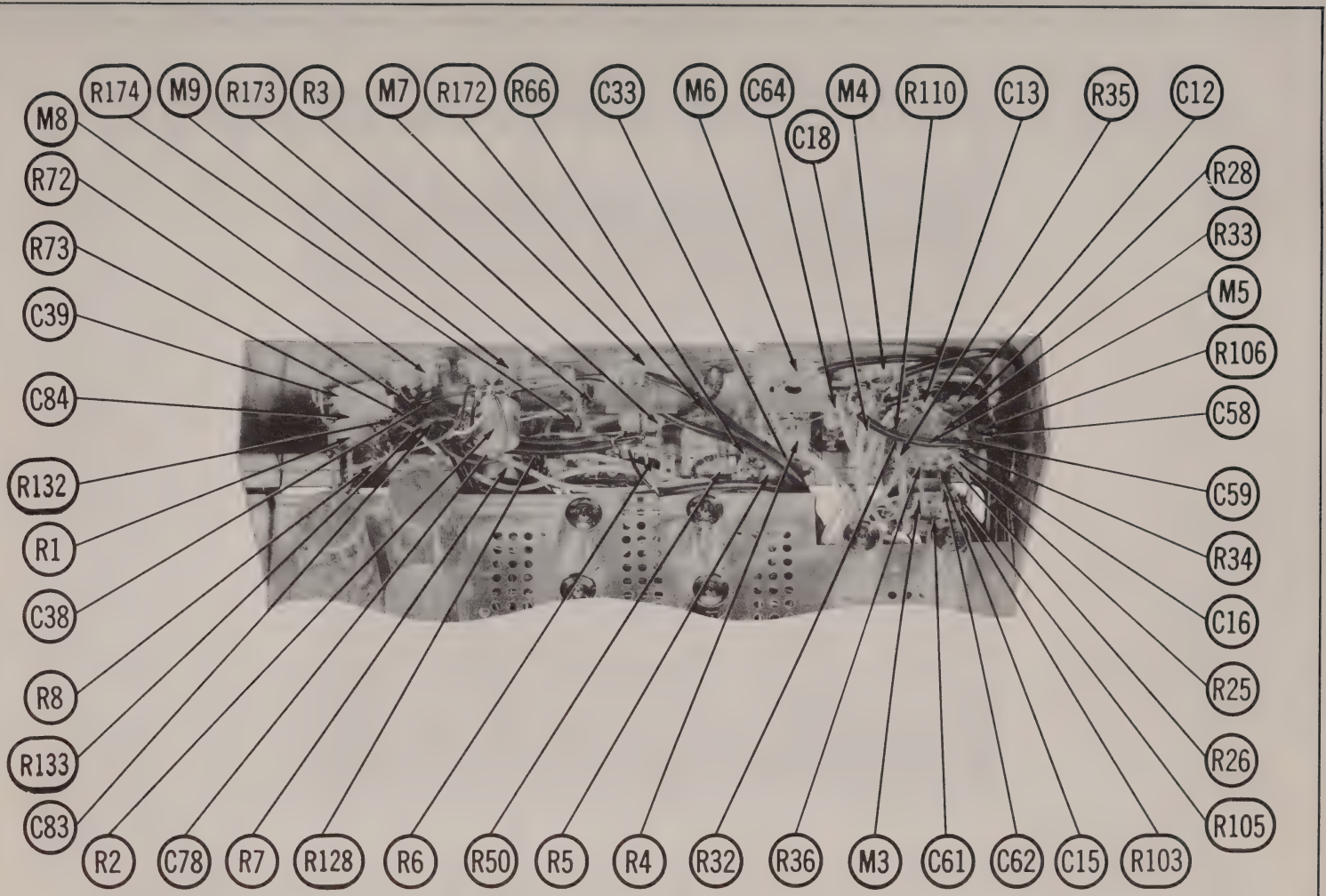
KV779

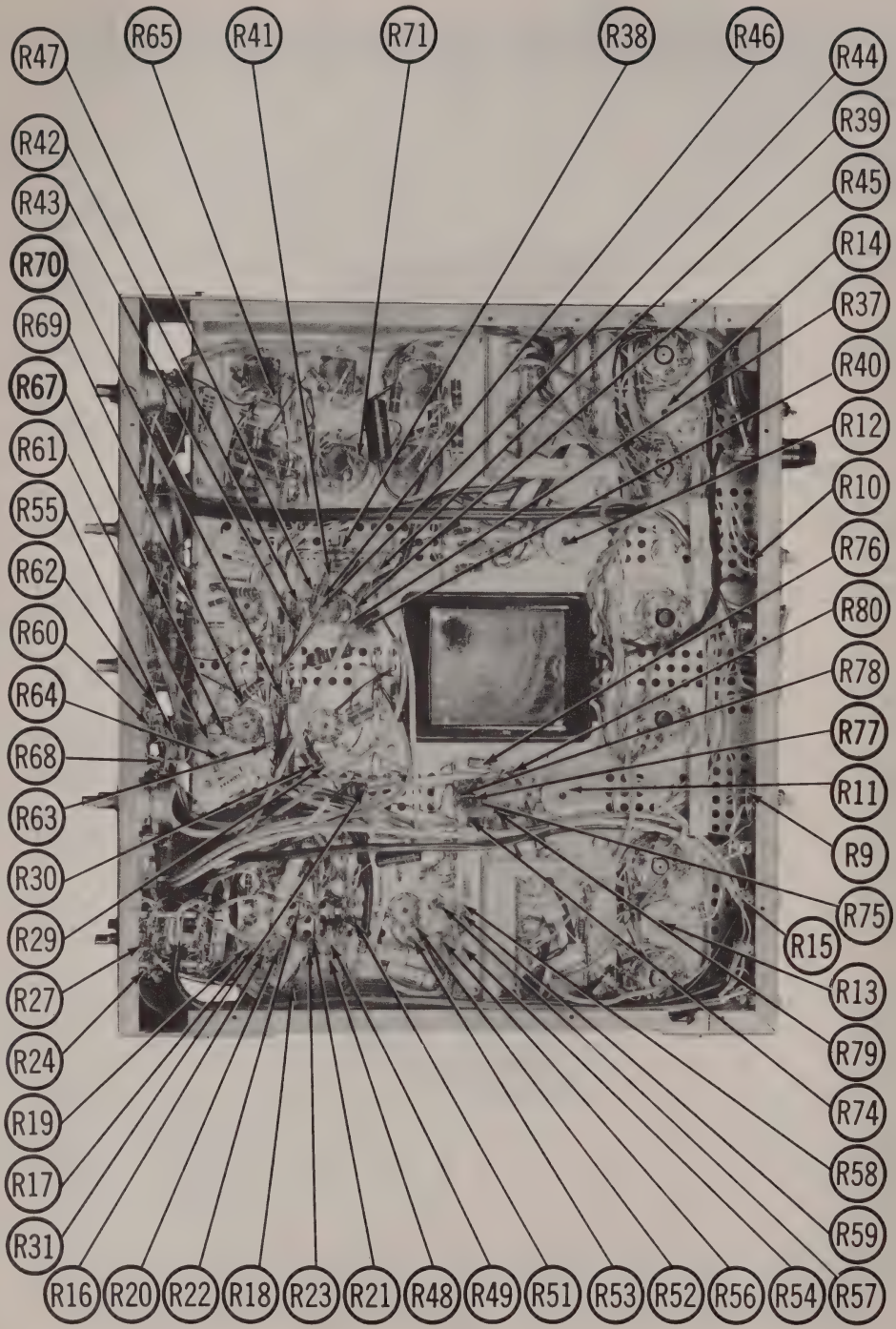
SET 556 FOLDER 13



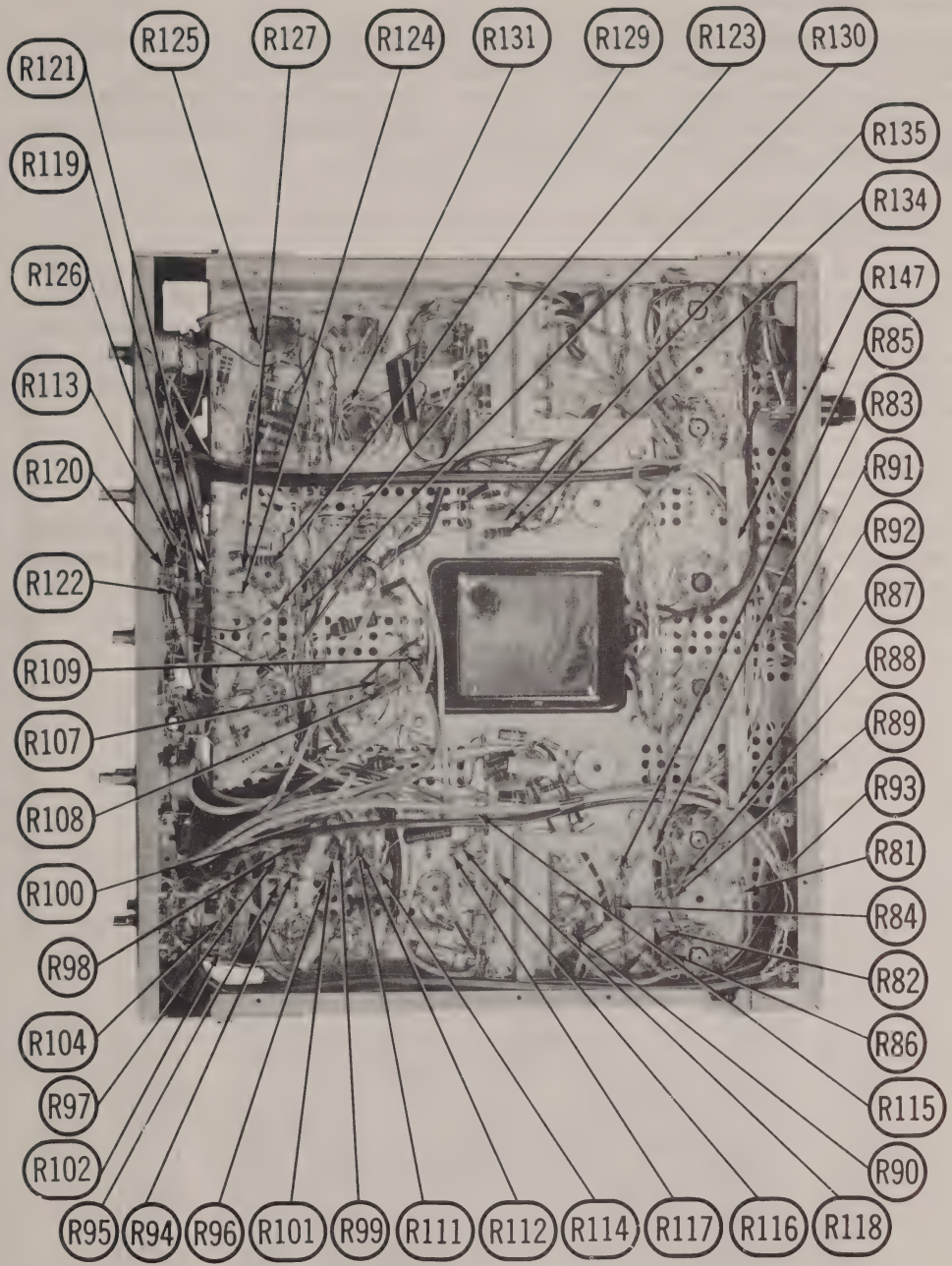
CHASSIS BOTTOM VIEW-CAPACITOR & MISC. IDENT.



CONTROL PANEL-REAR VIEW



CHASSIS BOTTOM VIEW-RESISTOR IDENT. (R1-R80)



CHASSIS BOTTOM VIEW-RESISTOR IDENT. (R81-135, R147)

BIAS ADJUSTMENT

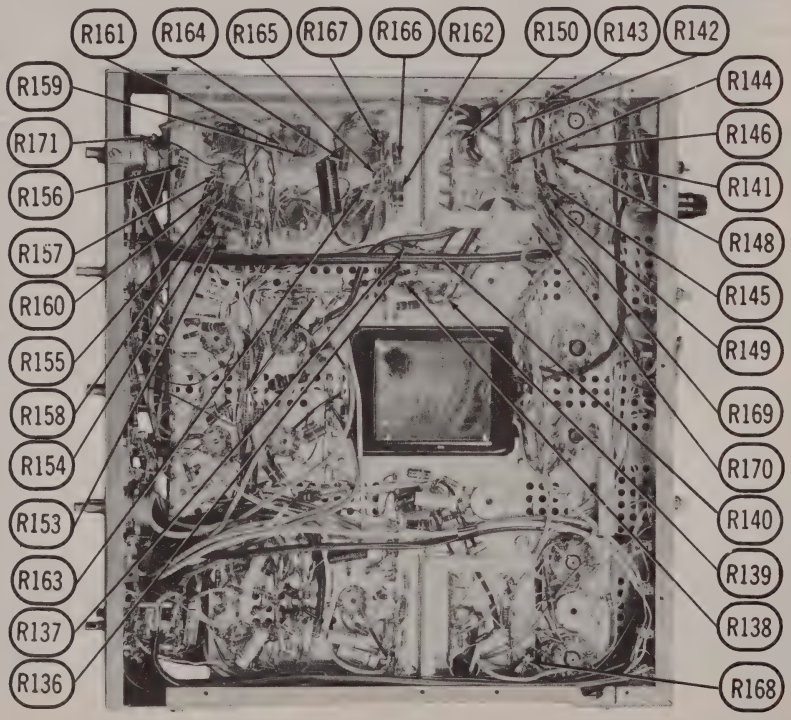
Disconnect straps on the meter terminal strip. Connect a milliameter (120-150 ma range) between center terminal and Channel A terminal. Adjust the Channel A Bias for a reading of 110 ma. Connect the meter between the center terminal and Channel B terminal. Adjust Channel B Bias for a reading of 110 ma. Reconnect the two straps.

DC BALANCE ADJUSTMENT

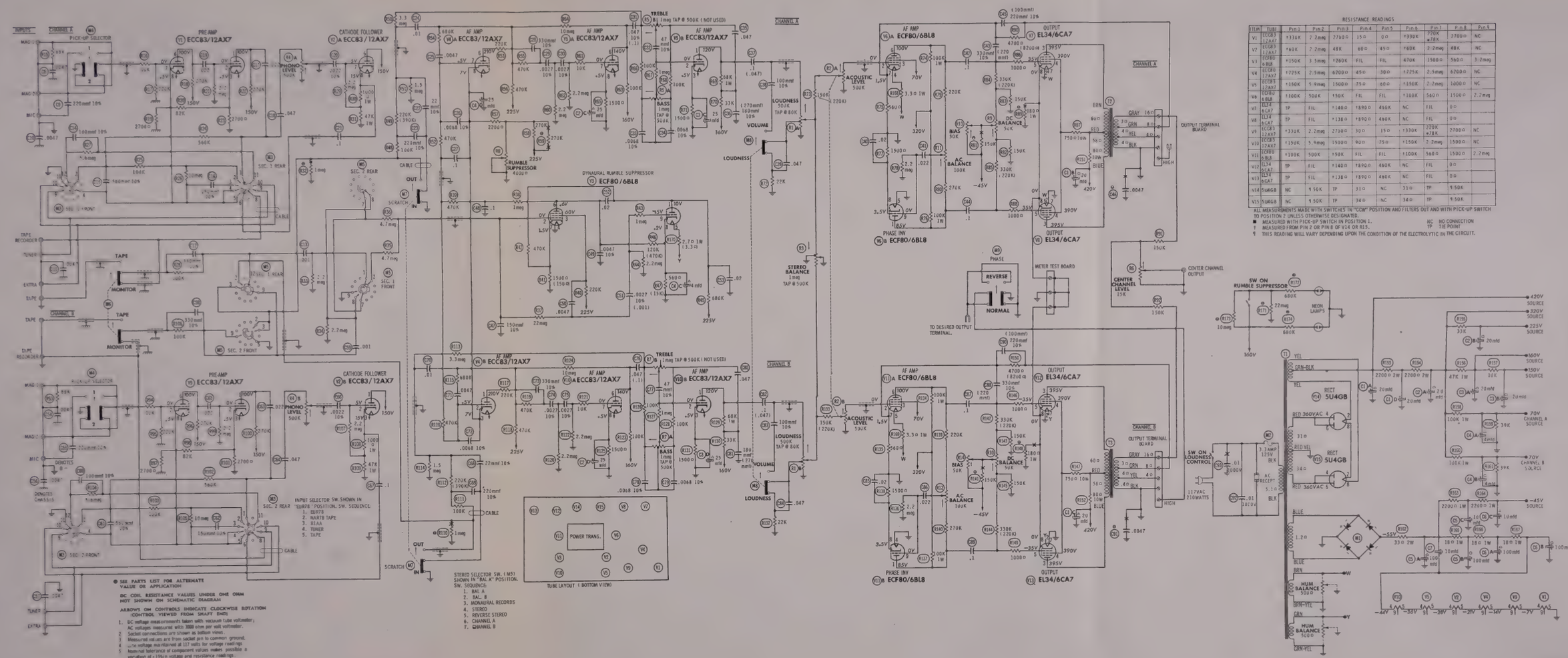
Connect a 16 ohm 10W resistor across the output terminals of the Amplifier. Connect a scope across the resistor. Turn the horizontal selector of scope to "Line". Remove the Phase Inverter tube of the amplifier and adjust the proper DC Balance control for MINIMUM 120 cycle response on scope. Repeat the procedure for the other channel. Reinstall the Phase Inverter Tube. Recheck the Bias.

AC BALANCE ADJUSTMENT

The AC Balance is adjusted for MINIMUM second harmonic distortion using a distortion or wave analyzer. Follow procedure outlined by test equipment manufacturer.



CHASSIS BOTTOM VIEW-RESISTOR IDENT. (R136-146, R148-171)



● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Normal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC83/12AX7	†330K	2.2meg	2700Ω	15Ω	0Ω	†330K	†70K ¤78K	2700Ω	NC
V2	ECC83/12AX7	†60K	2.2meg	48K	60Ω	45Ω	†60K	2.2meg	48K	NC
V3	ECF80/6BL8	†150K	3.5meg	†260K	FIL	FIL	470K	1500Ω	560Ω	3.2meg
V4	ECC83/12AX7	†725K	2.5meg	6200Ω	45Ω	30Ω	†725K	2.5meg	6200Ω	NC
V5	ECC83/12AX7	†150K	5.9meg	1500Ω	75Ω	60Ω	†150K	2.2meg	1400Ω	NC
V6	ECF80/6BL8	†100K	500K	†50K	FIL	FIL	†100K	560Ω	1500Ω	2.2meg
V7	EL34/6CA7	TP	FIL	†1400Ω	†890Ω	460K	NC	FIL	0Ω	
V8	EL34/6CA7	TP	FIL	†1380Ω	†890Ω	460K	NC	FIL	0Ω	
V9	ECC83/12AX7	†330K	2.2meg	2700Ω	30Ω	15Ω	†330K	†70K ¤78K	2700Ω	NC
V10	ECC83/12AX7	†150K	5.9meg	1500Ω	90Ω	75Ω	†150K	2.2meg	1500Ω	NC
V11	ECF80/6BL8	†100K	500K	†50K	FIL	FIL	†100K	560Ω	1500Ω	2.2meg
V12	EL34/6CA7	TP	FIL	†1400Ω	†890Ω	460K	NC	FIL	0Ω	
V13	EL34/6CA7	TP	FIL	†1380Ω	†890Ω	460K	NC	FIL	0Ω	
V14	5U4GB	NC	¶50K	TP	310Ω	NC	310Ω	TP	¶50K	
V15	5U4GB	NC	¶50K	TP	340Ω	NC	340Ω	TP	¶50K	

ALL MEASUREMENTS MADE WITH SWITCHES IN "CCW" POSITION AND FILTERS OUT AND WITH PICK-UP SWITCH TO POSITION 2 UNLESS OTHERWISE DESIGNATED.

■ MEASURED WITH PICK-UP SWITCH IN POSITION 1.

† MEASURED FROM PIN 2 OR PIN 8 OF V14 OR 815.

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.

NC NO CONNECTION

TP TIE POINT

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE
V1	Channel A Preamp.	ECC83/12AX7
V2	Channel A Cath. Follower-Channel B Cath. Follower	ECC83/12AX7
V3	Dynaural Rumble Suppressor	ECF80/6BL8
V4	Channel A AF Amp. - Channel B AF Amp.	ECC83/12AX7
V5	Channel A AF Amp.	ECC83/12AX7
V6	Channel A AF Amp. - Phase Inverter	ECF80/6BL8
V7	Channel A Output	EL34/6CA7
V8	Channel A Output	EL34/6CA7
V9	Channel B Preamp.	ECC83/12AX7
V10	Channel B AF Amp.	ECC83/12AX7
V11	Channel B AF Amp. - Phase Inverter	ECF80/6BL8
V12	Channel B Output	EL34/6CA7
V13	Channel B Output	EL34/6CA7
V14	Rectifier	5U4GB
V15	Rectifier	5U4GB

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA H. H. SCOTT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1A	▲20	475	CEC-4X20	AFH4-19-20	D0179.5	XC4-50	FP475	TMQ-4755	TVL-4834
B	■20	475							
C	▲20	475							
D	20	475							
C2A	▲20	450	CEC-2X20-2X25	AFH4-67	D0520	XC4-54	FP444.8	TMQ-4475	TVLS-4712.1*
B	■20	450							
C	▲25	25							
D	25	25							
C3A	▲20	450	CEC-2X20-2X25	AFH4-67	D0520	XC4-54	FP430.2	TMQ-4475	TVLS-4712.1*
B	■20	450							
C	25	25							
D	▲25	25							
C4A	▲4	250	CEC-3X4/25025/25	AFH4-48	D0070	XC4-5	WP433.6	TMQ-4607	TVL-4759.7
B	■4	250			BBR25-25	QT1-11	TC26	TD-25-25	TVA-1205
C	▲4	250							
D	25	25							
C5A	▲100	75	CEC-2X100-10CP						
B	■100	75							
C	10	75							
C6A	▲100	75	CEC-2X100-10CP						
B	■100	75							
C	▲10	75							
C7	10	25	CET10/25	PTT79	NLW10-25	MT1-5	TT50X10	MLV10-25	TE-1204

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C8	.0047		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C9	220 10%		1469-00022	TCZ-220	22R5T22	CM-19B-221K	CNO-322	MS-322
C10	.0047		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C11	.0047		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C12	330 10%		1469-00033		5R5T33	CM-19B-331K	MCB241	MS-333
C13	.001		DI-1000	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C14	100 10%		1469-0001	TCZ-100	22R5T1	CM-19B-101K	MCB235	MS-310
C15	560 10%		1469-00056		5R5T56	CM-19B-561K	MCJ247	MS-356
C16	150 10%		1469-00015	TCZ-150	22R5T15	CM-19B-151K	MCB236	MS-315

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C17	.022 400V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C18	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C19	.022 400V		P488N-022	DD-203	CUB4S47	4DP-2-223	GEM-4122	4TM-S22
C20	.0022 400V 10%		V84C4D22-10%		PM6D22	6DP-1-222	GEM-16222	6TM-D22
C21	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C22	22 10%		1469-000022	TCZ-22	22R5Q22	CM-19B-220K	CNO-422	MS-422
C23	220 10%		1469-00022	TCZ-220	22R5T22	CM-19B-221K	CNO-322	MS-322
C24	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C25	.0047 400V		P488N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C26	.0068 400V 10%		V84C4D68-10%		PM6D68	6DP-1-682	GEM-16268	6TM-D68
C27	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C28	330 10%		1469-00033		5R5T33	CM-19B-331K	MCB241	MS-333
C29	.0027 400V 10%		V84C6D3-10%		DPMS6D27	6DP-1-272	GEM-1623	6PS-D27
C30	.0027 400V 10%		V84C6D3-10%		DPMS6D27	6DP-1-272	GEM-1623	6PD-D27
C31	.047 400V	(.1) †	P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C32	47 10%		1469-000047	TCZ-47	22R5Q47	CM-19B-470K	CNO-447	MS-447
C33	.0068 400V 10%		V84C4D68-10%		PM6D68	6DP-1-682	GEM-16268	6TM-D68
C34	.0068 400V 10%		V84C4D68-10%		PM6D68	6DP-1-682	GEM-16268	6TM-D68
C35	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C36	180	(270) †	1469-00018	TCZ-180	22R5T18	CM-19B-181K	CNO-318	MS-318
C37	.1 400V	(.047) †	P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C38	100 10%		1469-0001	TCZ-100	22R5T22	CM-19B-101K	MCB235	MS-310
C39	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C40	.02		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C41	.022 400V		P488N-022	DD-203	CUB4S22	4DP-3-223	GEM-4122	4TM-S22
C42	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C43	330 10%	(220) †	1469-00033		5R5T33	CM-19B-331K	MCB241	MS-333
C44	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-473	GEM-401	4TM-P10
C45	220 10%	(100) †	1469-00022	TCZ-220	22R5T22	CM-19B-221K	CNO-322	MS -322
C46	.0047	Note 1		DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C47	150 10%		1469-00015	TCZ-150	22R5T15	CM-19B-151K	MCB236	MS-315
C48	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C49	.0047 400V 10%		V84C4D47-10%		PM6D47	6DP-1-472	GEM-16247	6TM-D47
C50	.0047		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C51	.0027 400V 10%	(.001) †	V84C6D3-10%		DPMS6D27	6DP-1-272	GEM-1623	6PS-D27
C52	.02		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C53	.02		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C54	.0047		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C55	220 10%		1469-00022	TCZ-220	22R5T22	CM-19B-221K	CNO-322	MS-322
C56	.0047		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C57	.0047		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C58	330 10%		1469-00033		5R5T33	CM-19B-331K	MCB241	MS-333
C59	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C60	100 10%		1469-0001	TCZ-100	22R5T1	CM-19B-101K	MCB235	MS-310
C61	560 10%		1469-00056		5R5T56	CM-19B-561K	MCJ247	MS-356
C62	150 10%		1469-00015	TCZ-150	22R5T15	CM-19B-151K	MCB236	MS-315
C63	.022 400V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C64	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C65	.022 400V		P488N-022	DD-203	CUB4S22	4DP-3-223	GEM-4122	4TM-S22
C66	.0022 400V 10%		V84C4D22-10%		PM6D22	6DP-1-222	GEM-16222	6TM-D22
C67	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C68	22 10%		1469-000022	TCZ-22	22R5Q22	CM-19B-220K	CNO-422	MS-422
C69	220 10%		1469-00022	TCZ-220	22R5T22	CM-19B-221K	CNO-322	MS-322
C70	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C71	.0047 400V		P488N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C72	.0068 400V 10%		V84C4D68-10%		PM6D68	6DP-1-682	GEM-16268	6TM-D68
C73	330 10%		1469-00033		PM6D68	6DP-1-682	MCB241	MS-333
C74	.0027 400V 10%		V84C6D3-10%		DPMS6D27	6DP-1-272	GEM-1623	6PS-D27
C75	.0027 400V 10%		V84C6D3-10%		DPMS6D27	6DP-1-272	GEM-1623	6PS-D27
C76	.047 400V	(.1) †	P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C77	47 10%		1469-000047	TCZ-47	22R5Q47	CM-19B-470K	CNO-447	MS-447
C78	.0068 400V 10%		V84C4D68-10%		PM6D68	6DP-1-682	GEM-16268	6TM-D68

PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C79	.0068 400V 10%		V84C4D68-10%		PM6D68	6DP-1-682	GEM-16268	6TM-D68
C80	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C81	180	(270) †	1469-000180	TCZ-180	22R5T18	CM-18B-181K	CNO-318	MS-318
C82	.1 400V	(.047) †	P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C83	100 10%		1469-0001	TCZ-100	22R5T1	CM-19B-101K	MCB235	MS-310
C84	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C85	.02		BPD-02	DD-203	BYB682	CCD-203	B-120	5HK-S20
C86	.022 400V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C87	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C88	330 10%	(220) †	1469-00033		5R5T33	CM-19B-331K	MCB241	MS-333
C89	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-S10
C90	220 10%	(100) †	1469-00022	TCZ-220	22R5T22	CM-19B-221K	CNO-322	MS-322
C91	.0047	Note 1	BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C92	.01 1000V		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C93	.01 1000V	Note 1	BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10

† Alternate Values.
Note 1. Not used in some versions.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: H.H. Scott PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	RCVD-500K-3	BT-66			FA55T15	Loudness, Channel A
	80K Tap		FSW					
B	500K	½		STR-66			RU55T15	Loudness, Channel B
	80K Tap							
C	Shaft			Not Req.			CS3500	
D	Switch			KR-1			US41	Power Off-On
R2A	500K	½	RCVC-500K	F1-40				Acoustic Level, Channel B
B	500K	½		R2-40				Acoustic Level, Channel A
R3A	1meg	½	RCV-1MST-3①	BT-71	A47F5-1meg	Q19-137X	UT-443	Stereo Balance
	500K Tap							
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R4A	500K	½	RCVC-500K	F1-40				Phono Level, Channel B
B	500K	½	①	R2-40				Phono Level, Channel A
R5A	1meg	½	RCVC-1MT	F1-56			■ UE4135	Bass, Channel A
	500K Tap							Treble, Channel A
B	1meg	½		R2-56				
	500K Tap							Center Channel
R6A	15K	½	RCV-15K-3	B-20	A47-15K-S	Q11-119	U26	
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R7A	1meg	½	RCVC-1MT	F1-56			■ UE4135	Bass, Channel B
	500K Tap							Treble, Channel B
B	1meg	½		R2-56				
	500K Tap							Rumble Suppressor
R8A	4000Ω	½	RCV-4000-3FSW	B-12		Q17-114	RU452R	
	Bushing			Not Req.		Not Req.	SL-38	
	Shaft						SL-3500	
B	Switch			KR-2		76-2	US-42	
R9A	50K	½	RCV-50K-P	BX-31	A47-50K-S	Q11-123	U35	DC Balance, Channel A
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	
R10A	50K	½	RCV-50K-P	BX-31	A47-50K-S	Q11-123	U35	DC Balance, Channel B
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	
R11A	100K	½	RCV-100K-P	BX-40	A47-100K-S	Q11-128	SU-41	AC Balance, Channel A
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	
R12A	100K	½	RCV-100K-P	BX-40	A47-100K-S	Q11-128	SU-41	AC Balance, Channel B
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	
R13A	50K	½	RCV-50K-P	BX-31	A47-50K-S	Q11-123	U35	Bias, Channel A
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	
R14A	50K	½	RCV-50K-P	BX-31	A47-50K-S	Q11-123	U35	Bias, Channel B
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	

① Some versions may use 1meg concentric dual in this application.
■ "STA-LOC" equivalent: FBI6T55, RU16T55, OS687, IS937.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R15	68K			
R16	10K			
R17	220K			
R18	270K			
R19	2700Ω			
R20	82K			
R21	2.2meg			
R22	270K			
R23	2700Ω			
R24	560K			
R25	100K			
R26	10meg			
R27	5.6meg			
R28	100K			
R29	2.2meg			
R30	1000Ω 1W			
R31	47K 1W			
R32	1meg			Note 1
R33	2.2meg			
R34	2.2meg			
R35	4.7meg			
R36	4.7meg			
R37	22meg			
R38	1meg			
R39	470K			
R40	220K			
R41	1500Ω			(150Ω) *
R42	470K			
R43	1meg			
R44	2.2meg			
R45	680K			
R46	120K			(470K) *
R47	560Ω			(15K) *
R48	100K			
R49	220K			(390K) *
R50	3.3meg			
R51	1.5meg			
R52	470K			
R53	220K			
R54	680K			
R55	470K			
R56	470K			
R57	2200Ω			
R58	270K			
R59	270K			Note 1
R60	2.2meg			
R61	10K			
R62	2.2meg			
R63	100K			
R64	10meg			
R65	1500Ω			
R66	100K			
R67	1meg			
R68	100K			
R69	68K 1W			
R70	33K			
R71	1500Ω			
R72	22K			
R73	150K			(220K) *
R74	100K 1W			
R75	560Ω			
R76	100K 1W			
R77	1500Ω			
R78	2.2meg			
R79	220K			
R80	270K			
R81	150K			Note 1

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R82	150K			Note 1
R83	150K			
R84	330K			(220K) *
R85	330K			(220K) *
R86	1000Ω			
R87	750K 10W			
R88	1000Ω			
R89	180Ω 1W			Note 1
R90	4700Ω			(8200Ω) *
R91	150K			
R92	150K			
R93	68K			
R94	10K			
R95	220K			
R96	270K			
R97	2700Ω			
R98	82K			
R99	2.2meg			
R100	270K			
R101	2700Ω			
R102	560K			
R103	100K			
R104	5.6meg			
R105	10meg			
R106	100K			
R107	2.2meg			
R108	1000Ω 1W			
R109	47K 1W			
R110	1meg			Note 1
R111	100K			
R112	220K			(390K) *
R113	3.3meg			
R114	1.5meg			
R115	680K			
R116	470K			
R117	220K			
R118	470K			
R119	470K			
R120	2.2meg			
R121	10K			
R122	2.2meg			
R123	100K			
R124	10meg			
R125	1500Ω			
R126	100K			
R127	1meg			
R128	100K			
R129	68K 1W			
R130	33K			
R131	1500Ω			
R132	22K			
R133	150K			(220K) *
R134	100K 1W			
R135	560Ω			
R136	2.2meg			
R137	100K 1W			
R138	1500Ω			
R139	220K			
R140	270K			
R141	150K			Note 1
R142	330K			(220K) *
R143	150K			
R144	330K			(220K) *
R145	150K			
R146	1000Ω			
R147	750Ω 10W			
R148	180Ω 1W			Note 1

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: WORKMAN TV PART No.	REPLACEMENT DATA: REMARKS
R149	1000Ω			
R150	4700Ω			(8200Ω) *
R151	80Ω 10W			
R152	80Ω 10W			
R153	2200Ω 2W			
R154	2200Ω 2W			
R155	33K			
R156	47K 1W			
R157	10K			
R158	100K 1W			
R159	39K			
R160	100K 1W			
R161	39K			

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: WORKMAN TV PART No.	REPLACEMENT DATA: REMARKS
R162	33Ω 2W			
R163	2200Ω 1W			
R164	2200Ω 1W			
R165	18Ω 1W			
R166	18Ω 1W			
R167	18Ω 1W			
R168	3.3Ω 1W			
R169	3.3Ω 1W			
R170	2.7Ω 1W			(3.3Ω) *
R171	22meg			Note 1
R172	680K			Note 1
R173	10meg			Note 1
R174	680K			Note 1

Note 1. Not used in some versions.
* Alternate Value.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	REPLACEMENT DATA: H.H. Scott PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	117V @ 1.9A	720VCT @ .230A DC	10VCT @ 3A	TR-30-5					
	SEC. 3	SEC. 4	SEC. 5						
	6.3V @ 3.4A	6.3V ⑤ 3.9A	50V @ .165A AC						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: H.H. Scott PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	4000Ω CT	16Ω Tap ⑤ 8Ω, 4Ω	TRA-12-2					
T3	4000Ω CT	16Ω Tap ⑤ 8Ω, 4Ω	TRA-12-2					

POWER RECTIFIERS

ITEM No.	RATING: CURRENT (Measured)	REPLACEMENT DATA: H.H. Scott PART No.	RCA PART No.	SARKES TARZIAN PART No.	NOTES
M1	.13A	*	1N2859 ♦		* Bridge Type Selenium ♦ 4 Required. Add surge limiter.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: H.H. Scott PART No. FUSE	H.H. Scott PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M2	3AG	3 2/10A 125V S/B			31303.2 (3AG 3 2/10A 125V S/B)	342001	MDX 3 2/10	HKP

MISCELLANEOUS

ITEM No.	PART NAME	H.H. Scott PART No.	NOTES
M3	Switch		Input Selector (Rotary Wafer Type)
M4	Switch		Pickup Selector (6 Pole DT Slide Type)
M5	Switch		Stereo Selector (Rotary Wafer Type)
M6	Switch		Tape Monitor (DPDT Slide Type)
M7	Switch		Scratch Filter (DPDT Slide Type)
M8	Switch		Loudness-Volume (DPDT Slide Type)
M9	Switch		Phase Reverse-Normal (DPDT Slide Type)

WIRING DATA

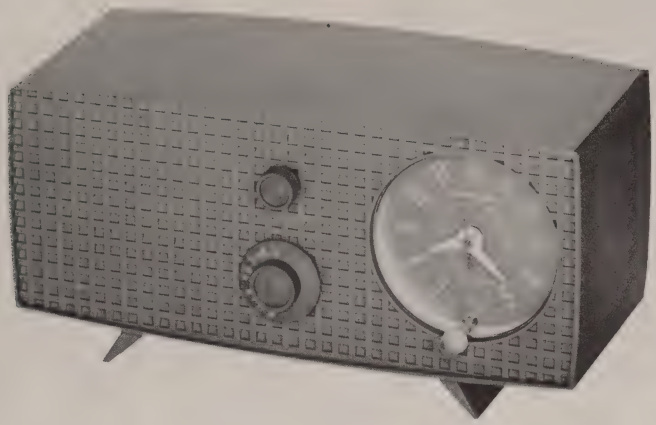
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT® Folder with CIRCUITRACE®

SILVERTONE
MODEL 1030 (Ch. 528.53950)

SILVERTONE
MODEL 1030 (Ch. 528.53950)



SILVERTONE
MODEL 1030 (Ch. 528.53950)

TRADE NAME	Silvertone Model 1030 (Ch. 528.53950)
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois
TYPE SET	AC Operated 4 Tube AM Receiver With Electric Clock
POWER SUPPLY	105 — 125 Volts AC, 60 Cycles RATING 26 Watts, .26 Amp. @ 117 Volts AC (Less Clock)
TUNING RANGE—BROADCAST	540 — 1600KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1, A2..... GENERAL CEMENT #5097, 8727
WALSCO #2515
A3, A6.... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A4, A5.... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of Converter. Low side to B-.	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2	Adjust for maximum output.
2.	"	1600KC	1600KC	"	A3	"
3.	Loop	600KC	600KC	"	A4, A5	"
4.	"	1400KC	1400KC Signal.	"	A6	Adjust for maximum output. Repeat Steps 2, 3 and 4.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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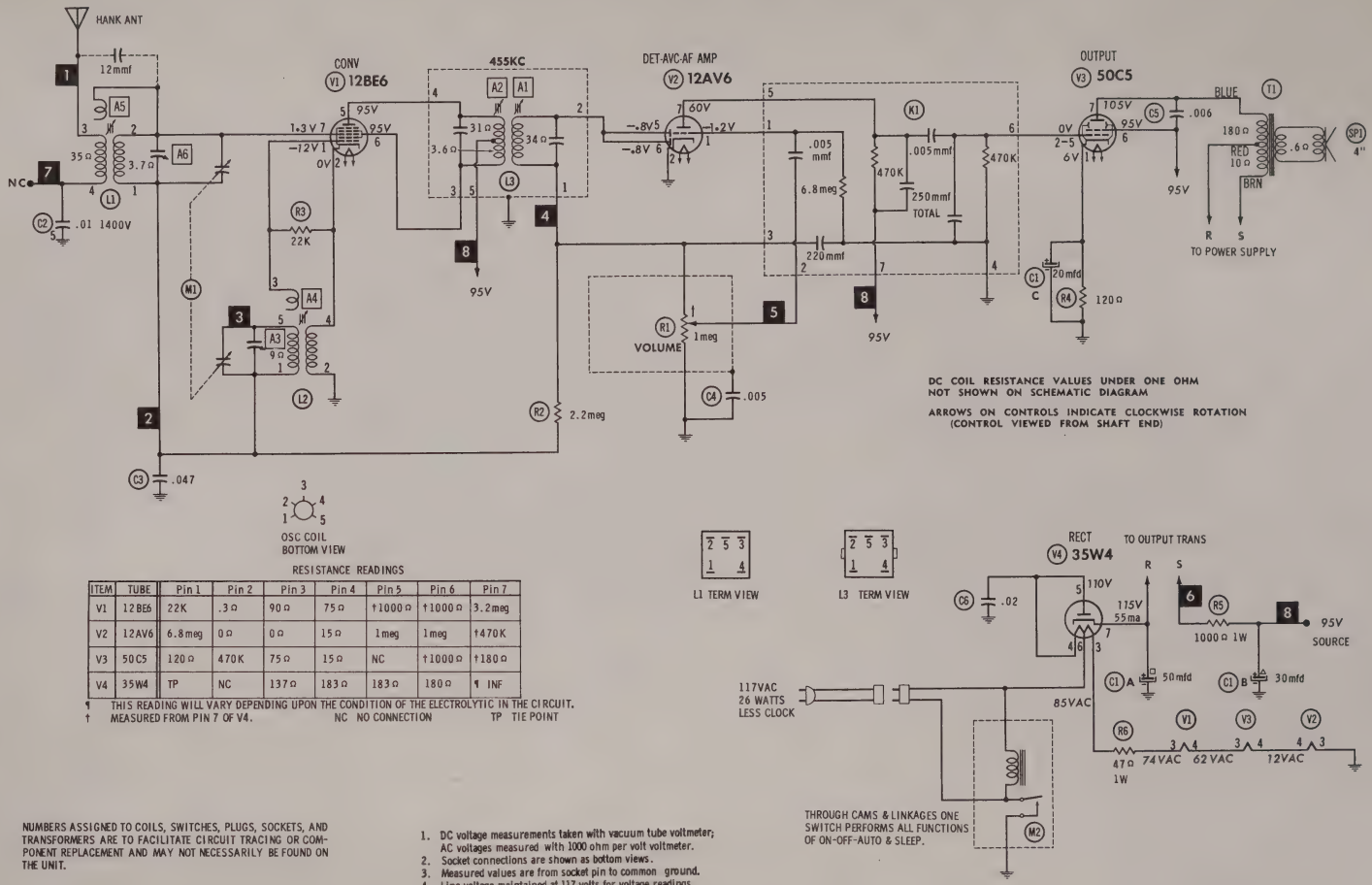
KG882

SET 556 FOLDER 14



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.3Ω	90Ω	75Ω	†1000Ω	†1000Ω	3.2meg
V2	12AV6	6.8meg	0Ω	0Ω	15Ω	1meg	1meg	†470K
V3	50C5	120Ω	470K	75Ω	15Ω	NC	†1000Ω	†180Ω
V4	35W4	TP	NC	137Ω	183Ω	183Ω	180Ω	¶ INF

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V4. NC NO CONNECTION TP TIE POINT

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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SILVERTONE
MODEL 1030 (Ch. 528.53950)

PARTS LIST AND DESCRIPTIONS

TUBES

◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Converter	12BE6	V3	Output	50C5
V2	Det. -AVC-AF Amp.	12AV6	V4	Rectifier	35W4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1A	■50	150	18-48-5	PWH3-81-50	C0560 †	XC3-28 ‡	PFP311.12	TMT-3078 ♦	PCL-3440.5
B	▲30	150							
C	20	25							

† Use printed circuit adapters #55277 & 55278.
‡ Use printed circuit adapter kit PMA1
♦ Use printed circuit adapter kit TMA.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.01 1400V		DAC-01	DD16-103	HVE16S1	16DP-3-103	UAC-110	BL-S10
C3	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C4	.005		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C5	.006		DAC-006	DD-602	HVE16D6	6DP-1-602	B-260	BL-D60
C6	.02		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	1meg	½	24-381-0					Volume

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R2	2.2meg			
R3	22K			
R4	120Ω			

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R5	1000Ω 1W			
R6	47Ω 1W			

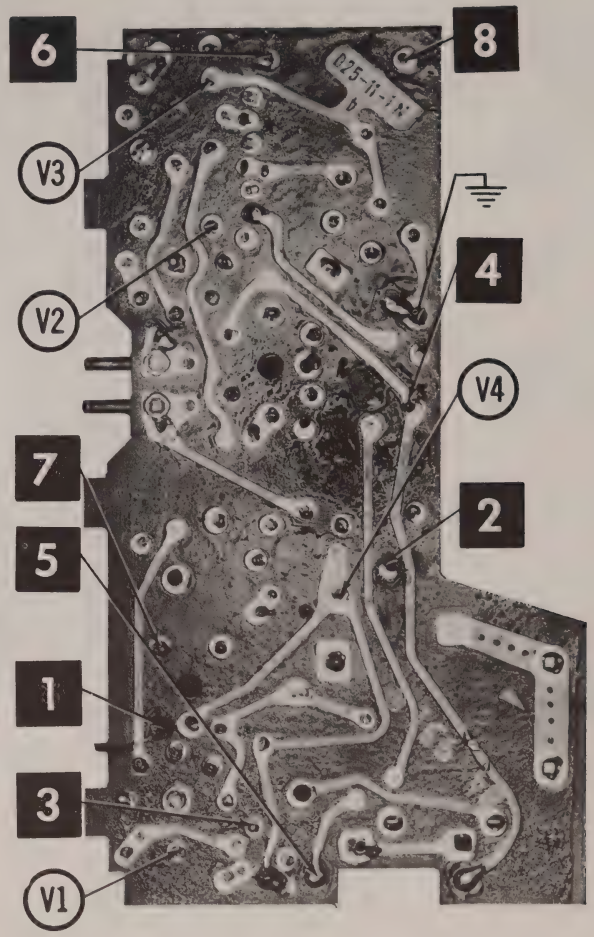
COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SILVERTONE PART No.	REPLACEMENT DATA
K1	Audio Coupling	220mmf, 250mmf (2) .005mmf, (2) 470K, 6.8meg	13-14-3	Aerovox PA-512-3 Centralab PC-158 Mallory MS-107 Sprague DT-5

PRINTED BOARD

A Howard W. Sams CIRCUITRACE® Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		SILVERTONE PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1 L2 L3	Ant. Osc. IF	10-22-0 ① 10-30-4 10-66-2					① Includes C 2

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	SILVERTONE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2500Ω Tap② 5%	3-4Ω	80-95-1				S-16X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SILVERTONE PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	33-402-4 *	4A07	* Includes T1

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M1	Tuning Cap.	19-65-2	2 Gang
M2	Timer	59-168	
	Printed Board Ass'y	84-9319-0	Less Tubes & Tube Shields
	Printed Board	25-11-1	Less Tubes & and all Components

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

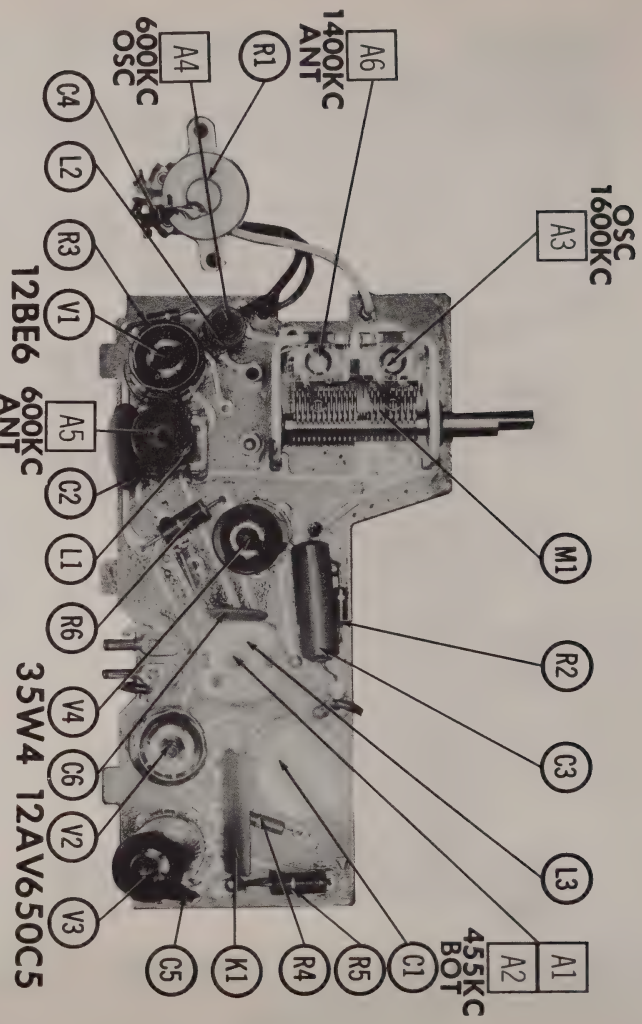
NAME	PART NO.	DESCRIPTION
Crystal	48-150-1	Clock
Knob	52-650-0	Clock
Knob	52-1200-0	Tuning
Knob	52-1201-0	Volume
Cabinet	42-75-1	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord (Interlock Type) ..... Use BELDEN No. 8874

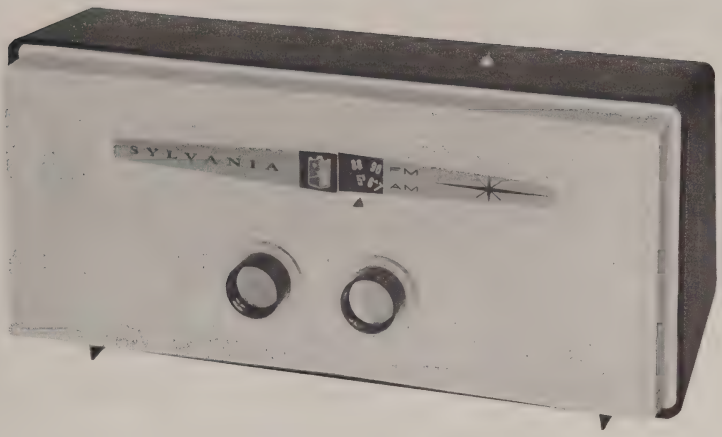
CHASSIS—TOP VIEW



PHOTOFACT® Folder

SYLVANIA
MODEL 6F18E, T (Ch. 678-1)

SYLVANIA
MODEL 6F18E, T (Ch. 678-1)



SYLVANIA
MODEL 6F18E, T (Ch. 678-1)

TRADE NAME	Sylvania Models 6F18E, 6F18T (Ch. 678-1)
MANUFACTURER	Sylvania Home Electronics, Div. of Sylvania Electric Products, Inc., 700 Ellicott St., Batavia, N. Y.
TYPE SET	AC Operated 6 Tube FM-AM Receiver
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 30 Watts, .33 Amp. @ 117 Volts AC
TUNING RANGE-BROADCAST	540 – 1600KC FREQ. MOD. 88 – 108MC

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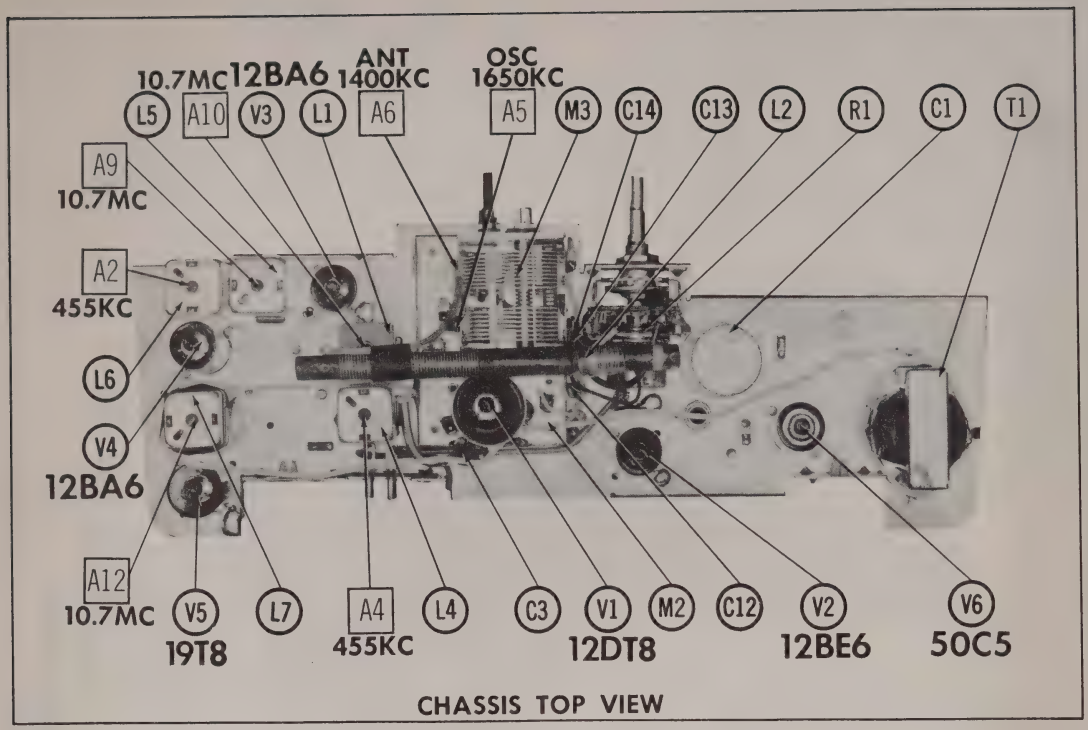
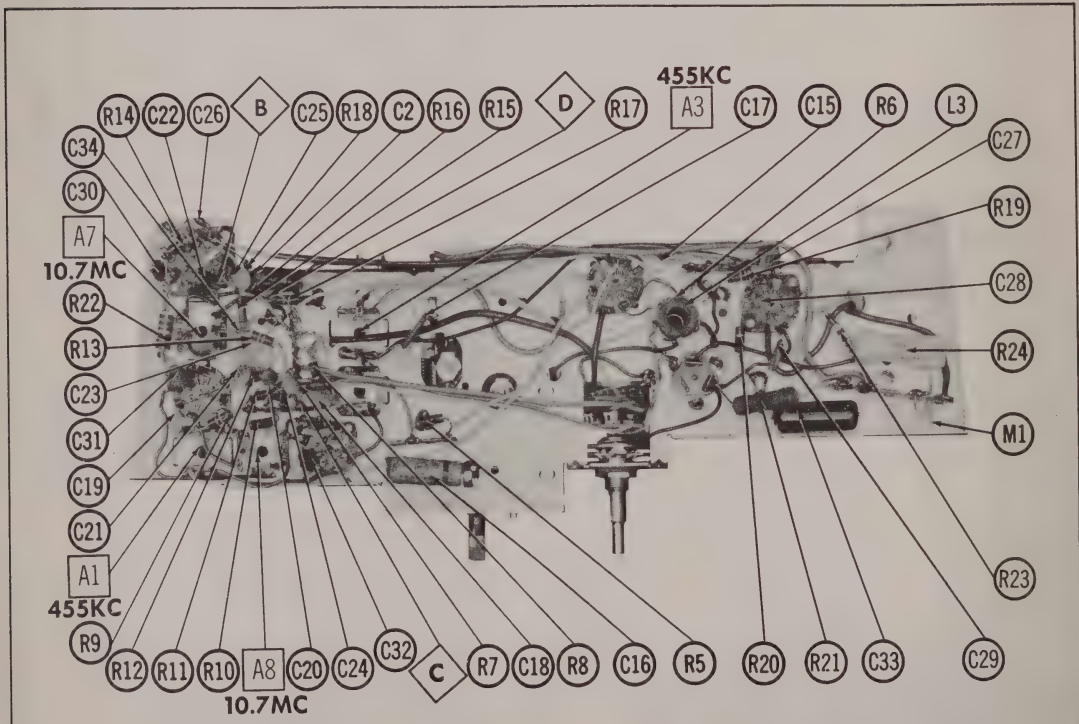
KK816

SET 556 FOLDER 15



CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use only enough generator output to provide a usable indication.

Suggested Alignment Tools:

A1 thru A4, A7, A12. . GENERAL CEMENT #5097, 8727
WALSCO #2515

A5, A6. . . . . GENERAL CEMENT #5004, 5009, 8195, 8274, 8275, 8607, 8728, 8987, 8988, 8989, 9291
WALSCO #2515, 2520, 2522, 2523, 2531, 2532, 2534, 2537, 2538

A8, A9, A10. . . . . GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545

A11. . . . . GENERAL CEMENT #8282, 8606, 8606-L, 9091
WALSCO #2526, 2541, 2542, 2543, 2544

A13, A14. . . . . GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532

AM ALIGNMENT — SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of AM Converter. Low side to chassis.	455KC (400∿ 30% AM)	(AM) Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	"	1650KC	"	"	A5	"
3.	Fashion loop of several turns of wire and radiate signal into loop of receiver.	1400KC	1400KC Signal.	"	A6	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM—SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	High side thru .005mfd to point Ⓐ. Low side to chassis.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe to point Ⓑ. Common to chassis.	A7, A8, A9, A10, A11	Adjust for maximum deflection.
5.	"	"	"	DC probe to point Ⓒ. Common to point Ⓓ.	A12	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE — SELECTOR IN FM POSITION

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	High side thru .005mfd to point Ⓐ. Low side to chassis.	10.7MC (450KC Swp)	(FM) Point of non-interference.	Vert. amp. to point Ⓑ. Low side to chassis.	A7, A8, A9, A10, A11	Disconnect stabilizing capacitor C2. Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Reconnect C2.
5.	"	"	"	Vert. amp. to point Ⓒ. Low side to chassis.	A12	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT — SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	High side thru .005mfd to point Ⓐ. Low side to chassis.	108MC (Unmod.)	(FM) 108MC	DC probe to point Ⓑ. Common to chassis.	A13	Adjust for maximum deflection.
7.	"	88MC	88MC	"	A14	"

FIG. 1

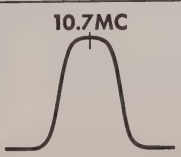
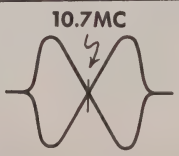


FIG. 2



PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	FM RF Amp. -FM Conv.	12DT8	V4	2nd FM IF Amp. -AM Det.	12BA6
V2	AM Converter	12BE6	V5	Ratio Det. -AF Amp.	19T8
V3	1st FM-AM IF Amp.	12BA6	V6	Output	50C5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SYLVANIA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1A	▣80	150	161-2030	AFH2-18	B0170	XC2-30	WP216.24	TMD-2140	TVL-2442.2
B	▲60	150							
C2	2	50	161-1067	PTT88	NLW2-50	MT1-1	TC302	MLV2-50	TE-1301

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	47		SI 47	D6-470	L10Q47	CCD-470	GP447	10TS-Q47
C4								
C5	.001		EF-001	MFT-1000		CCF-102	CT280A	
C6	15 N750 5%			DTN-15	C10Q15U	CCTN-150	CN7-415	10TCU-Q15
C7	9 N80 5%	(8.5) †				*		
C8								
C9	68 N750 5%			DTN-68	C10Q68U	CCTN-680	CN7-468	10TCU-Q68
C10	5 N220 5%					*		10TCR-V5
C11	8.5 N80 5%					*		
C12	450		EF-0005	MFT-500		CCF-501		
C13	.001		EF-001	MFT-1000		CCF-102	CT280A	
C14	.001		EF-001	MFT-1000		CCF-102	CT280A	
C15	220		DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22
C16	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S50
C17	.02		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C18	.005		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C19	100 N150					*		10TCP-T10
C20	220		DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22
C21	.005		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-L50
C22	.002		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C23	220 N750 10%		N750-DI 220	TCN-220	C10T22U	CCTN-221	CN7-322	10TCU-T22
C24	.0015		BPD-0015	DD-152	BYA10D15	CCD-152	B-215	5HK-D15
C25	.005		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C26	220		DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22
C27	.005		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C28	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C29	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C30	.002		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C31	.002		BPL-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C32	.002		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C33	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C34	6.8 N220					*		10TCR-V6.8

* Not normally in distributor' stock. Available thru distributor on order to manufacturer.
† Alternate Value.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SYLVANIA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	Switch		157-0071					AM-FM
B	470K	½						Volume
C	Switch							Power Off-On

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R2	2200Ω			
R3	47K			
R4	5600Ω			
R5	2.2meg			
R6	22K			
R7	1meg			
R8	330Ω			
R9	100K			
R10	1.5meg			
R11	1.5meg			
R12	330Ω			
R13	47K			

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R14	4.7meg			
R15	1meg			
R16	12K			(11K) *
R17	12K			(11K) *
R18	220K			
R19	470K			
R20	150Ω			
R21	1000Ω 3W	PW3-1000	3G-1000	
R22	470Ω 1W			
R23	10Ω			
R24	33Ω			Fuse Type

* Alternate Value.

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		SYLVANIA PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	2nd FM IF	121-0125					
L2	Loopstick	581-0036	BC-419	705-A		T532	
L3	AM Osc.	113-0099	BC-393	69-OSC	RTC-8646	T503	
L4	1st AM IF	121-0124					
L5	3rd FM IF	122-0126	FM-254	1463	RTC-8599	T633	
L6	2nd AM IF	122-0125	BC-353	12-C2	RTC-8633	T608	
L7	Ratio Detector	128-0022	FM-255	1465	RTC-8600	T635	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	SYLVANIA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	3100Ω Tap@ 8%	3-4Ω	143-0116	A-3031	A-3336	24S89	S-16X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SYLVANIA PART No.	QUAM PART No.	
SP1	5"	PM	3-4Ω	539-0517	5A07	

POWER RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA			NOTES
	CURRENT (Measured)	SYLVANIA PART No.	RCA PART No.	SARKES TARZIAN PART No.	
M1	.075A	517-0029	1N1763	2F4	

MISCELLANEOUS

ITEM No.	PART NAME	SYLVANIA PART No.	NOTES
M2	FM Tuner	170-0069	Complete
M3	Tuning Cap.	170-0063	2 Gang. (Ant. 15-258mmf, Osc. 17-127mmf)

CABINETS & CABINET PARTS

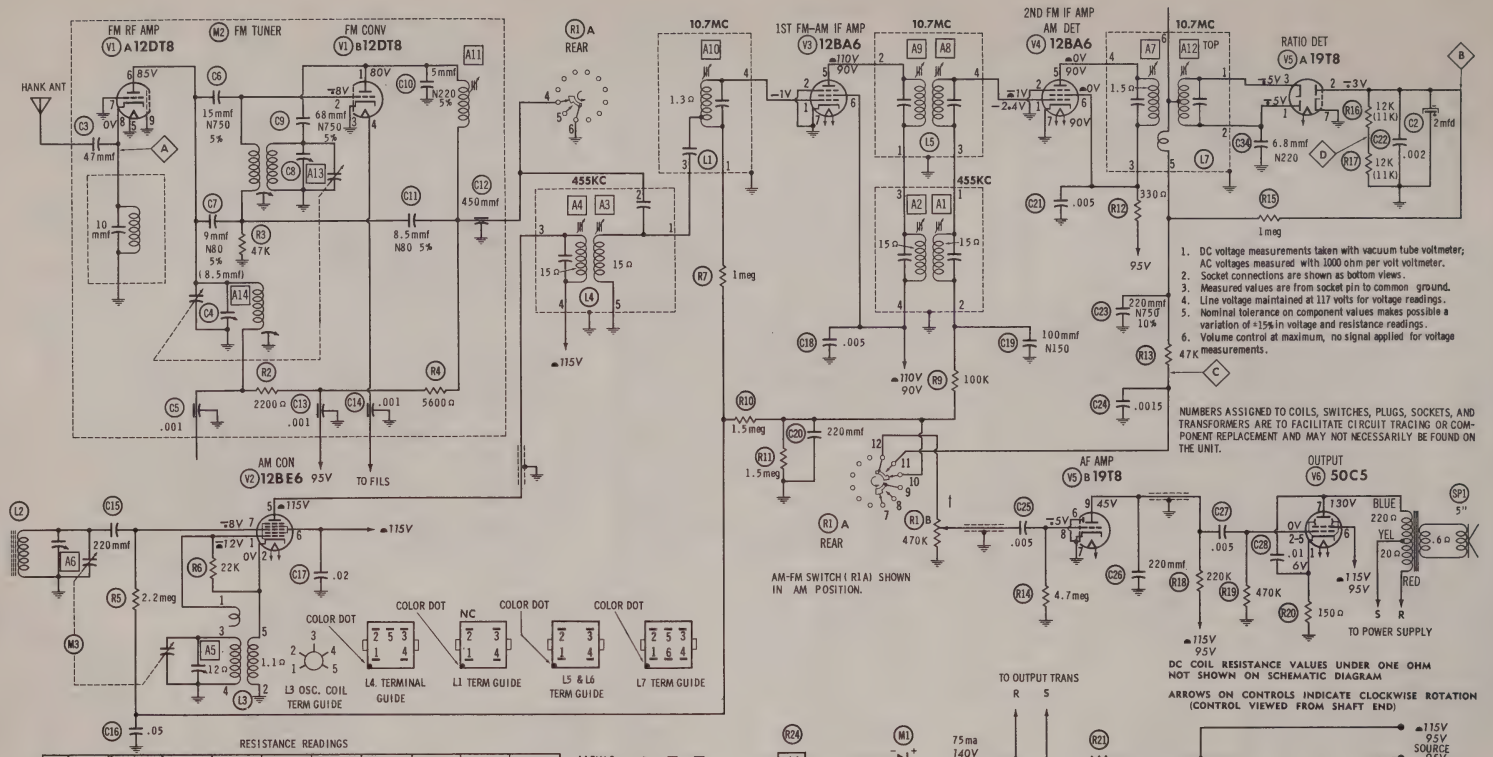
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Dial	722-0090	
Knob	740-0462	Tuning Model 6F18E
Knob	740-0463	Tuning Model 6F18T
Knob	740-0460	Volume Model 6F18E
Knob	740-0461	Volume Model 6F18T
Knob	740-0464	Function Selector
Cabinet Back	813-0171	Model 6F18E
Cabinet Back	813-0172	Model 6F18T
Cabinet Front	774-0034	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12DT8	†6600Ω	47K	0Ω	15Ω	0Ω	†3200Ω	0Ω	.1Ω	0Ω
V2	12BE6	22K	1.1Ω	15Ω	30Ω	▬†1000Ω	▬†1000Ω	▬4meg		
V3	12BA6	4meg ▬2.8meg	0Ω	45Ω	30Ω	†1300Ω	†1300Ω	0Ω		
V4	12BA6	1.6meg ▬450K	0Ω	45Ω	60Ω	†1300Ω ▬† INF	†1300Ω ▬† INF	0Ω		
V5	19T8	350K	24K	350K	85Ω	60Ω	0Ω	0Ω	4.7meg	†220K
V6	50C5	150Ω	470K	85Ω	135Ω	NC	†1000Ω	†220Ω		

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
▬ MEASURED IN "AM" POSITION.
† MEASURED FROM OUTPUT OF M1.
NC NO CONNECTION

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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SYLVANIA
MODEL 6F18E, T (Ch. 678-1)

PHOTOFACT® Folder with CIRCUITRACE®

TOSHIBA
MODEL 9TM-40

TOSHIBA
MODEL 9TM-40

TOSHIBA
MODEL 9TM-40

TRADE NAME	Toshiba Model 9TM-40
IMPORTER	Transistor World Corp., 52 Broadway, New York 4, N. Y.
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	6 Volts DC RATING 9MA @ 6 Volts DC (No Signal, Min. Volume)
TUNING RANGE–BROADCAST	540 – 1600KC 25MA @ 6 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1, A2, A3, A5, A8..... GENERAL CEMENT #5004, 5009, 8195, 8274, 8275, 8607, 8728, 8987, 8988, 8989, 9291
WALSCO #2515, 2520, 2522, 2523, 2531, 2532, 2534, 2537, 2538
A4, A6, A7..... GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

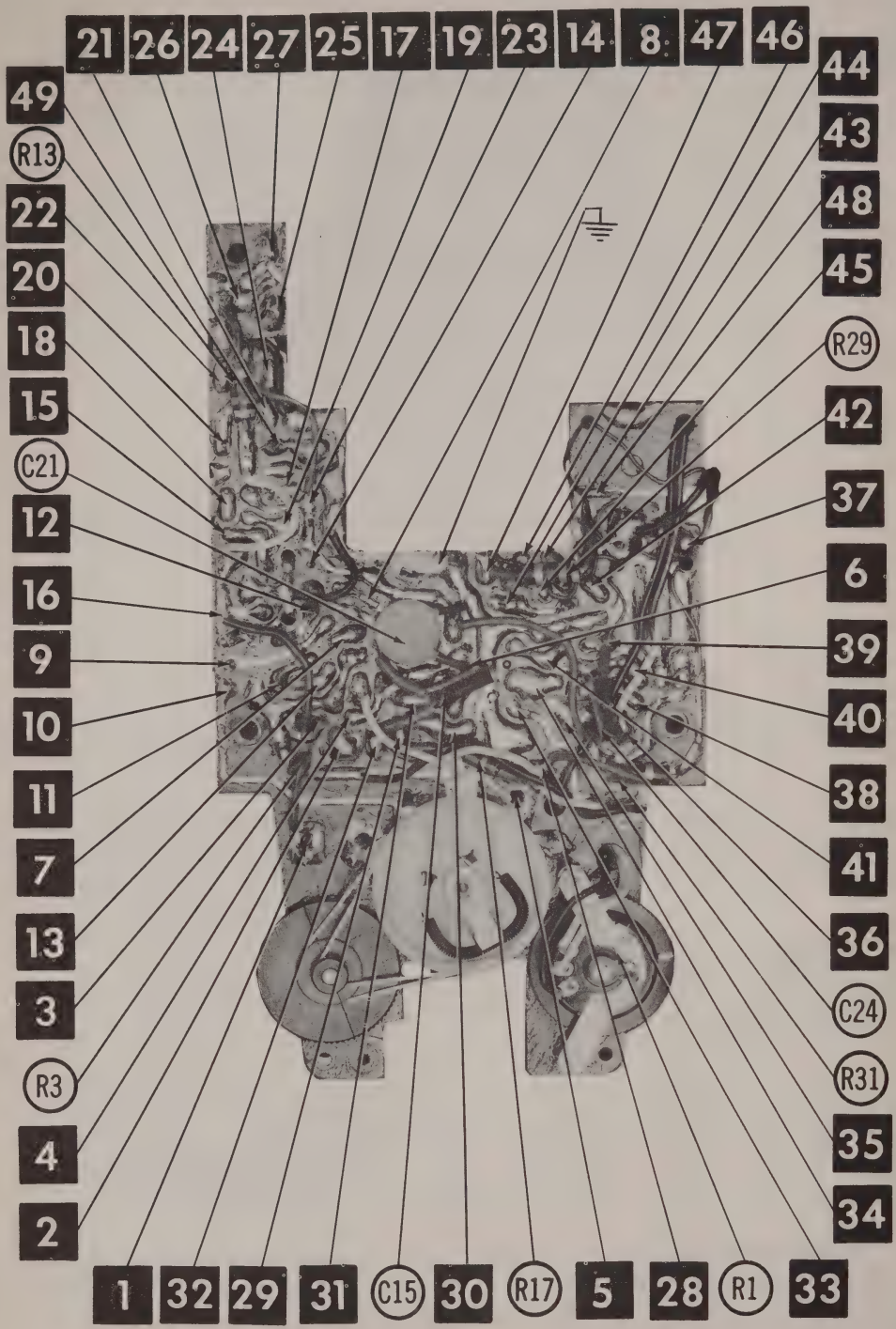
	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Fashion loop of several turns of wire and radiate signal into loop of receiver.	455KC (400% Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Adjust for maximum output.
2.	"	1600KC	1600KC	"	A4	"
3.	"	600KC	600KC	"	A5	"
4.	"	1400KC	1400KC Signal.	"	A6, A7	"
5.	"	600KC	600KC Signal.	"	A8, A9	Adjust for maximum output. Adjust A9 by moving coil along ferrite core. Repeat Steps 2 thru 5.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

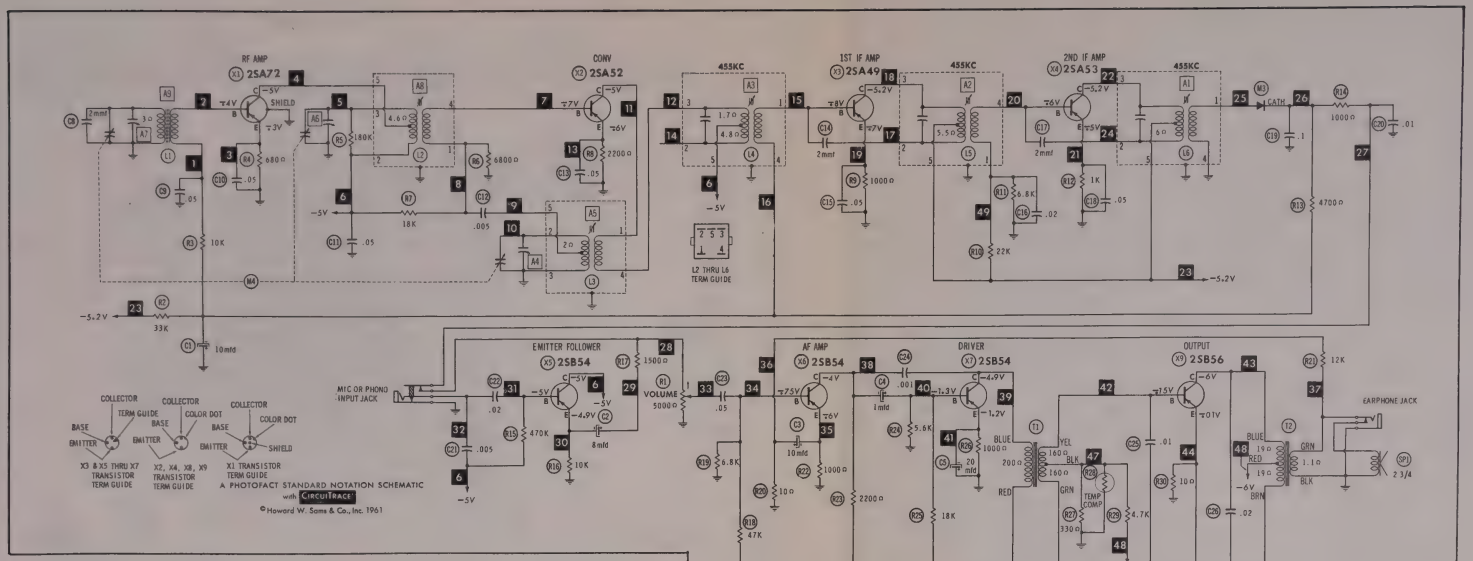
KF812

SET 556 FOLDER 16



A Howard W. Sams CIRCUITRACE Photo

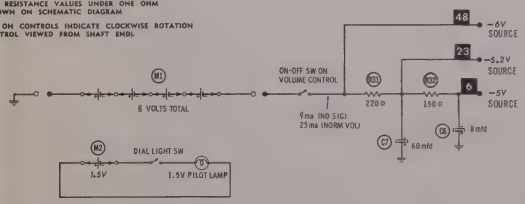
PRINTED BOARD



RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

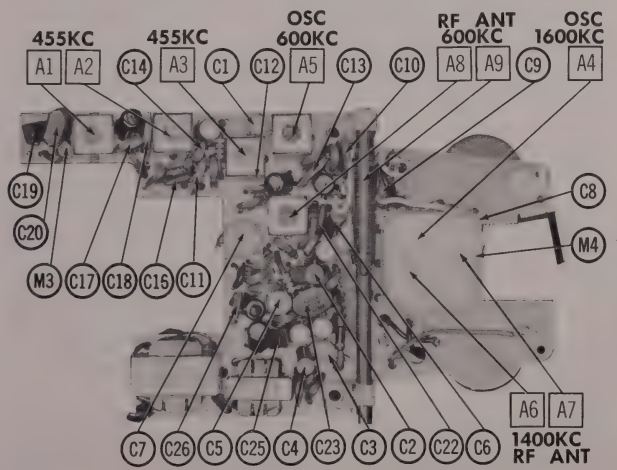
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END).



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

TOSHIBA
MODEL 9TM-40



CHASSIS TOP VIEW-ALIGN., CAPACITOR & MISC. IDENT.

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA		NOTES
			RCA PART No.	RAYTHEON PART No.	
X1	2SA72	RF Amplifier	2N412		PNP
X2	2SA52	Converter	2N410		PNP
X3	2SA49	1st IF Amplifier	2N410		PNP
X4	2SA53	2nd IF Amplifier	2N406		PNP
X5	2SA54	Mic Emitter Follower	2N406		PNP
X6	2SB54	AF Amplifier	2N406		PNP
X7	2SB54	Driver	2N408		PNP
X8	2SB56	Output	2N408		PNP
X9	2SB56	Output			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	TOSHIBA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1	10	3		PTT6	NLW10-6	MT1-5	TT3X10	MLV10-3	TE-1053
C2	8	3		PTT5	NLW8-10	MT1-5	TT6X8	MLV10-3	TE-1052.5
C3	10	3		PTT6	NLW10-6	MT1-5	TT3X10	MLV10-3	TE-1053
C4	1	10		PTT34	NLW1-50	MT1-1	TT12X1	MLV2-12	TE-1120
C5	20	3		PTT8	NLW20-6	MT1-10	TT15X20	MLV20-12	TE-1054
C6	8	5		PTT22	NLW8-10	MT1-5	TT6X8	MLV10-6	TE-1086
C7	60	6		PTT29	NLW75-10	MT1-18	TT6X60	MLV50-6	TE-1101

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C8	2		NPO-DI 2.0	DTZ-2R2	C10V2C	CCTO-2R2	CNO-522	10TCC-V22
C9	.05		C80V503AM	DA-503	H-05S5		TA-150	TG-S50
C10	.05		C80V503AM	DA-503	H-05S5		TA-150	TG-S50
C11	.05		C80V503AM	DA-503	H-05S5		TA-150	TG-S50
C12	.005		C80V502AM	DM-502	H-05D5	CCD-502	TA-250	TG-D50
C13	.05		C80V503AM	DA-503	H-05S5		TA-150	TG-S50
C14	2		NPO-DI 2.0	DTZ-2R2	C10V2C	CCTO-2R2	CNO-522	10TCC-V22
C15	.05		C80V503AM	DA-503	H-05S5		TA-150	TG-S50
C16	.02		C80V203AM	DA-203	H-05S2		TA-120	TG-S20
C17	2		NPO-DI 2.0	DTZ-2R2	C10V2C	CCTO-2R2	CNO-522	10TCC-V22
C18	.05		C80V503AM	DA-503	H-05S5		TA-150	TG-S50
C19	.1		C80V104AM	DA-104	H-05P1		TA-D10	TG-P10
C20	.01		C80V103AM	DA-103	H-05S1		TA-110	TG-S10
C21	.005		C80V502AM	DM-502	H-05D5	CCD-502	TA-250	TG-D50
C22	.02		C80V203AM	DA-203	H-05S2		TA-120	TG-S20
C23	.05		C80V503AM	DA-503	H-05S5		TA-150	TG-S50
C24	.001		C80V102AM	DM-102	H-05D1	CCD-102	B-210	5HK-D10
C25	.01		C80V103AM	DA-103	H-05S1		TA-110	TG-S10
C26	.02		C80V203AM	DA-203	H-05S2		TA-120	TG-S20

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	TOSHIBA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	5000Ω	1/4						Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R2	33K				R18	47K			
R3	10K				R19	6800Ω			
R4	680Ω				R20	10Ω			
R5	180K				R21	12K			
R6	6800Ω				R22	1000Ω			
R7	18K				R23	2200Ω			
R8	2200Ω				R24	5600Ω			
R9	1000Ω				R25	18K			
R10	22K				R26	1000Ω			
R11	6800Ω				R27	330Ω			
R12	1000Ω				R28	Temp. Comp.			
R13	4700Ω				R29	4700Ω			
R14	1000Ω				R30	10Ω			
R15	470K				R31	220Ω			
R16	10K				R32	150Ω			
R17	1500Ω								

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		TOSHIBA PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	Loopstick						
L2	RF						
L3	Osc.						
L4	1st IF						
L5	2nd IF						
L6	3rd IF						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	TOSHIBA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1.2	1	0435A					

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	TOSHIBA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	300Ω CT	10-12Ω	0799A					

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	TOSHIBA PART No.	QUAM PART No.	
SP1	2 3/4"	PM	10-12Ω	50156	27A06Z12	

BATTERIES

ITEM No.	VOLTAGE	TOSHIBA PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1. 5V			930		1015		M-15R	4 Required (Radio)
M2	1. 5V			930		1015		M-15R	1 Required (Pilot Lite)

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		TOSHIBA PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	
M3	1S50			1N60	Detector (Pigtail)

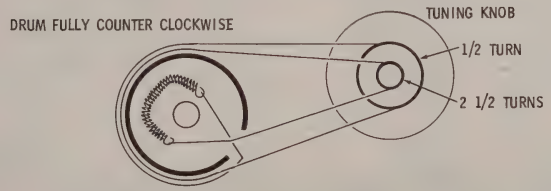
MISCELLANEOUS

ITEM No.	PART NAME	TOSHIBA PART No.	NOTES
M4	Tuning Cap.		2 Gang

WIRING DATA

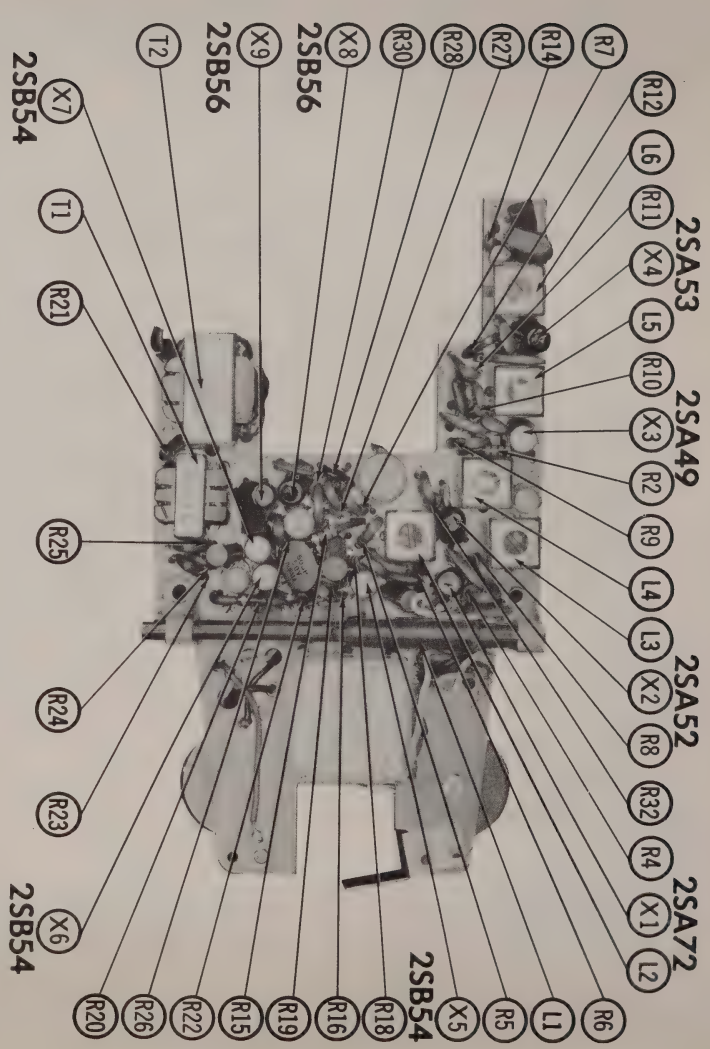
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

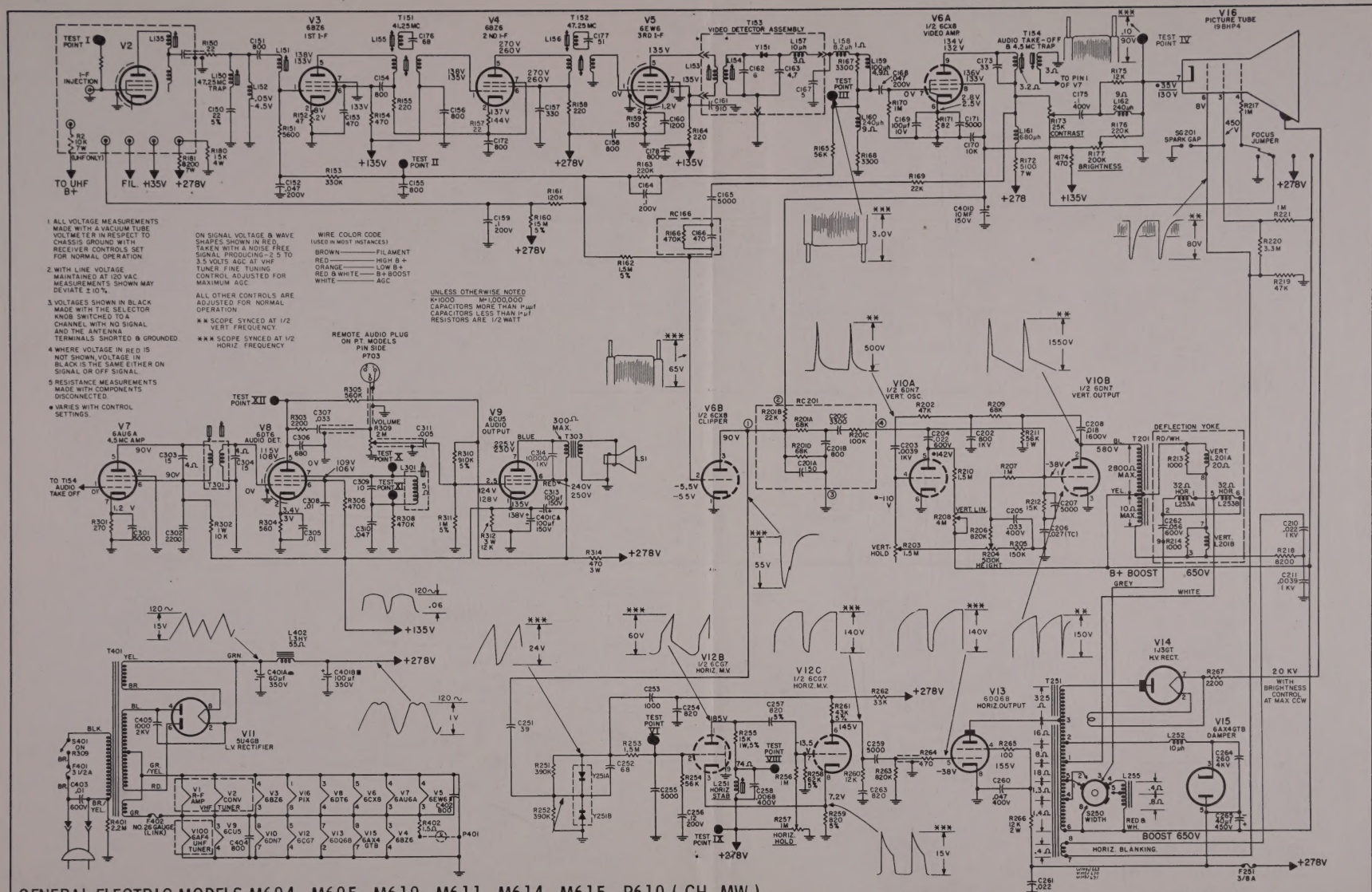
DRIVE CORD STRINGING



FRONT VIEW

CHASSIS—TOP VIEW

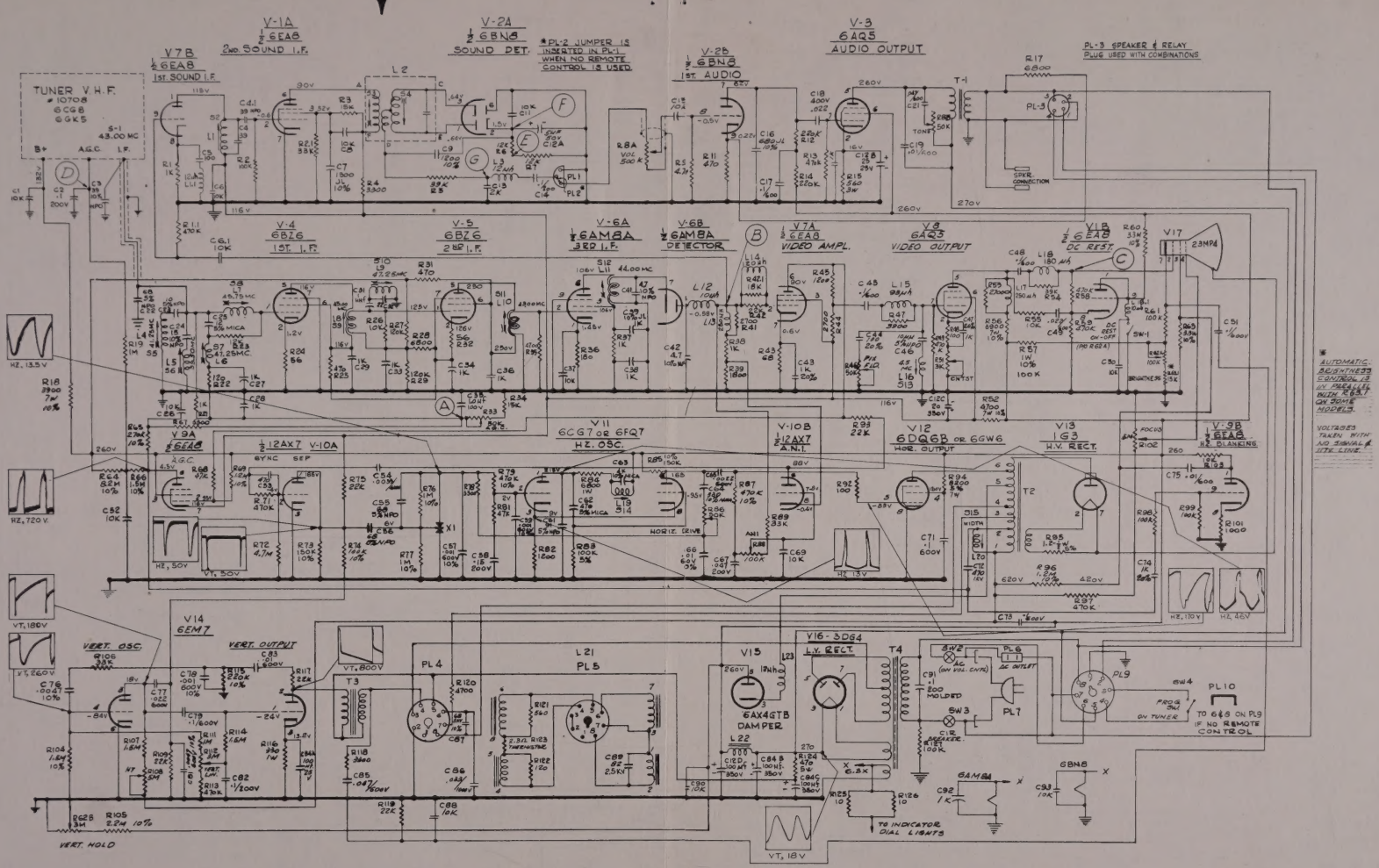




GENERAL ELECTRIC MODELS M604, M605, M610, M611, M614, M615, R610 (CH. MW)

Schematic Diagram Courtesy of General Electric Company

PACKARD BELL



PACKARD BELL MODELS 23DC10, 23DC12, 23DC13,
23DD7, 23DD8, 23DT1, 27DD1 (CH. 98D14, C)

Schematic Diagram Courtesy of Packard Bell Electronics Corp.

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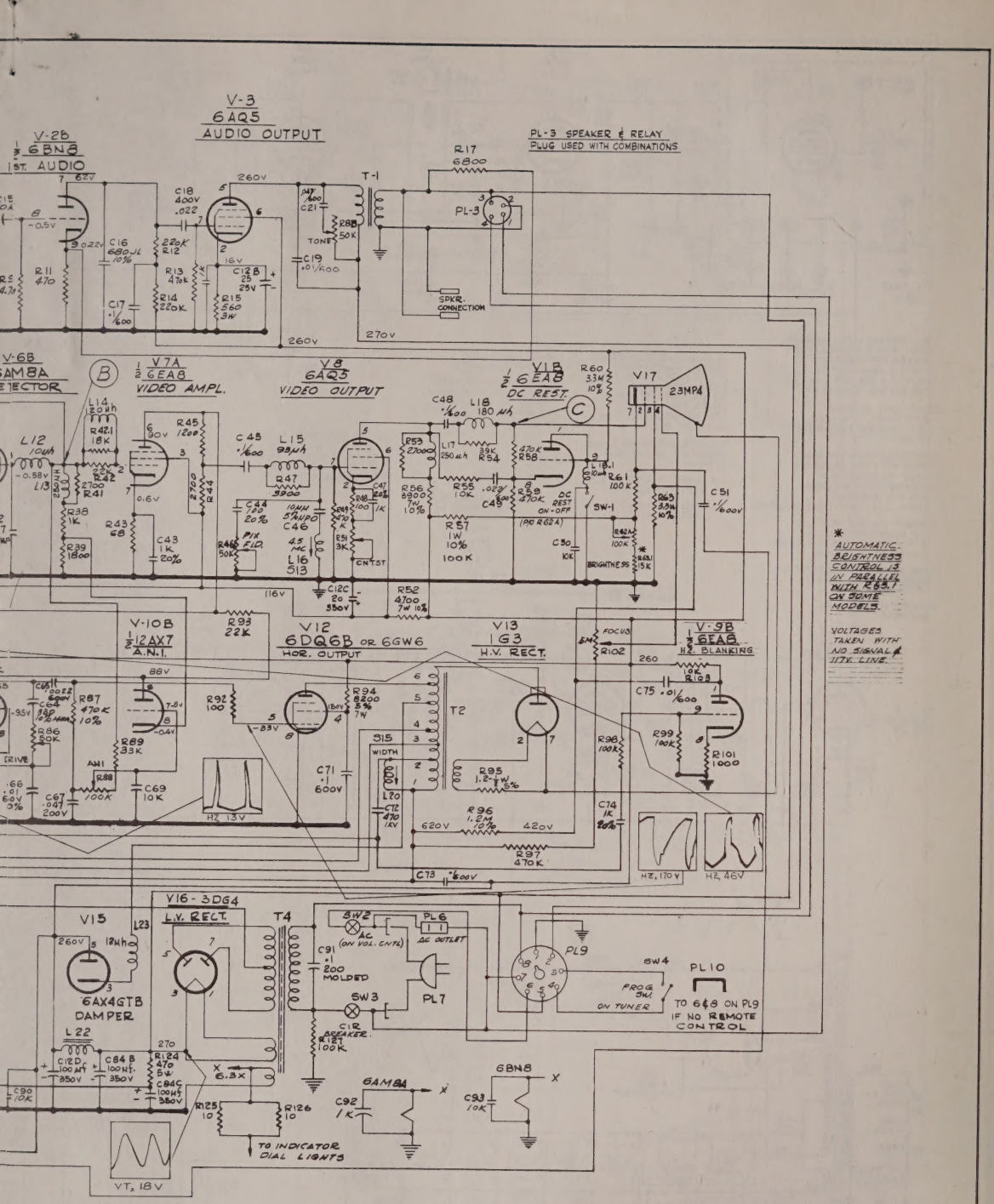

Schematic Diagram Courtesy of Packard Bell Electronics Corp.